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Nature in Avon

Volume 66

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Front Cover. Midland Thorn in flower. Tony Smith (See page 2)

Editorial

17 DEC 2007

The phrase "Wildlife is all about us" has two meanings. It has been adopted as a slogan by the Avon Wildlife Trust, and articles in this journal vividly demonstrate both meanings. Trees have been planted on Bristol streets for over three hundred years for the benefit of Bristolians, and we are thus the inheritors of an amazing legacy. Roads have been widened and the seed-bank from the past has abruptly germinated at St Georges Hill, Easton-in-Gordano. Every motorist stuck interminably at the M5 junction roundabout enjoys the wonderful year-round display that has resulted from the efforts of Robert Buck to preserve this. In 1809 a previous generation dug a huge three kilometre channel for the Avon, the New Cut, now a wonderful city centre green corridor.

This summer three of the largest wind turbines ever constructed in Britain have been built at Avonmouth, and their impact on the birds that migrate through the area, and that feed on the Severn mud in winter, will be closely monitored. This is micro-generation in practice, and getting away from the hugely inefficient electrical grid system, which wastes up to 50% of all power generated, is crucial to a sustainable energy system. But wind power is fickle, and there has been a failure in recent years to use the water power that our ancestors took for granted. Plans for a barrage across the Estuary were rightly rejected twenty years ago because of the huge destruction of habitats that it would involve not just in the area dammed, but on the downstream coast, and on the Mendips or wherever the chosen source of rock was. But tidal stream turbines, feeding power to local communities, and using the power that daily runs to waste in our rivers provide an alternative.

Phenology monitors the changes that weather causes in plants and animals, and it is regretted that there is no Botany Report in this issue, as plants respond most obviously. I hope that the rich seam of botanic articles will help make up for it.

Erratum. We regret that the following items in the Obituary of ACK Fear in Vol 65 p117 were incorrect, and we apologise for any distress caused.
The bizarre fatal accident in 1976 was not to Mary Fear but to her lifelong friend and fellow BNS member, Joan Hague.
It was in 1991 that ACK Fear was called home from an Italian journey with his friend Philip Houlder (not Boulder) by the news of Mary's death.
His daughter left her London flat to look after him, but had already abandoned her career in 1988 when diagnosed with ME.

The Midland Hawthorn, *Crataegus laevigata.*

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The picture on the cover of this volume shows one of the rarest of our local plants, found in only 16 of the 1500 one-km squares of the region. This is the story of its discovery.

In the course of the hedgerow survey of Little Sodbury, Pauline Wilson identified a single plant of Midland Hawthorn growing on the southern edge of a field just off the Cotswold Way. In 2007 Pauline invited botanists from the BNS and BRERC to hunt for it and see it in flower, and, incidentally, to confirm its identity.

We expect the Hawthorn *Crataegus monogyna* to have deeply lobed leaves but when we look at the Midland Hawthorn there are only a few shallow scallops in a much more rounded leaf. This is quite characteristic and obvious when one looks carefully. The essential characteristic that the botanist searches for is the presence of two stigmas in the cup of the flower. It is often noticeable that all the blossoms are tinged pink.

May 9th became a very wet and chilly evening, disappointing after one of the warmest Aprils on record. Trudging in leaking waterproofs along overgrown paths around several fields with tangled, wet, coarse, tussocky grass and having to veer off frequently to examine every flowering spray of Whitethorn flowers, one felt was more and more becoming an effort as every bush turned out to be the "normal" species. But suddenly, Pauline went round one of the fields instead of following the Long Distance path and we traipsed after without much expectation. But, see the picture taken in the pouring rain, as, with bright sunny smiles, we examined several shrubs on the south side of the field and found the Midland species with its specific characteristics.

Weather report for 2006

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The data in this report is based on the Times daily weather report. 2006 was characterized by a cold late spring, a very hot July and September, and the second equal hottest autumn since 1881, very wet May, March and November, very dry January and April. Both temperature and rainfall for all other months lay within the limits of one standard deviation. July had 40% more sunshine hours than normal, but the year as a whole had 10% fewer because of an exceptionally gloomy December. The overall mean maximum temperature was 14.7C, and 1.0C above the average since 1881. Overall rainfall was 944mm compared with the average since 1853 of 891mm.

Year	1997	98	99	00	01	02	03	04	05	2006
Avg Max C	14.6	14.2	14.6	14.1	13.8	14.3	15.0	14.3	14.4	14.7
Ten year avg C	13.7	13.8	13.8	13.8	13.8	14.0	14.2	14.3	14.2	14.4
Rainfall mm	877	1065	1106	1250	860	1178	758	951	896	955
Ten year avg mm	927	942	966	1003	995	1010	978	970	954	973

Table 1 Decadal average mean maximum temperature and rainfall

Seasons

The average for the **winter** (Dec-Feb) was 7.1C, the coldest since 1996/97. Rainfall was a little below average. There were 41 frost nights (October to April), the last on April 10th. There were 19 nights with cold enough to create ice, and 3 days with snow lying. The coldest spell was from March 1st-6th.

Spring (March-May) Temperature was almost identical to the long term average, though it began with a very cold spell in March, delaying the onset of spring. There was 30% more rainfall than average as May had double the normal rainfall most of it falling May 17th-27th, causing problems for single brooded bird species.

Summer,(June-Aug.) at 22.4C, was the hottest since 1994, dominated by an exceptional July, the hottest since 1983, and the third hottest July in Bristol since 1881. Rainfall was a little below average.

Autumn, (Sep.-Nov.) at 16.1C, was the hottest since 1959. All three months were warmer than average, September by the largest proportion. November began with four frost nights, but became progressively warmer. Rainfall was a little above average as November was unusually wet.

Seasonal Comparisons.

To put the 2006 seasonal average temperatures into perspective, Table 2 shows the seasonal temperature extremes, with their year, and the average, since 1881.

	2006	Min	Max	Avg
Winter	7.1	1917 2.5	1920 10.6	7.6
Spring	12.7	1887 10.4	1893 16.6	12.9
Summer	22.4	1883 18.0	1976 23.9	20.1
Autumn	16.1	1915 10.6	1959 16.8	14.0
Annual	14.7	1892 12.1	1921 15.6	13.7

Table 2 2006 seasons compared with minimum, maximum and average since 1881

Table 3 shows the average monthly rainfall in each season for 2006, and compares it with the extreme figures and average since 1853.

	2006	Min	Max	Avg
Winter	61	1964 21	1995 154	77
Spring	89	1893 17	1981 107	60
Summer	61	1995 11	1879 140	73
Autumn	103	1978 26	1935 173	87
Annual	944	1864 590	1882 1253	891

Table 3 Average monthly rainfall in mm for each season in 2006 compared with maximum, minimum, and average since 1853 .

Monthly temperatures.
Nine months were warmer than the long term average, three (January to March) were colder. Graph 1 shows the percentage differences.

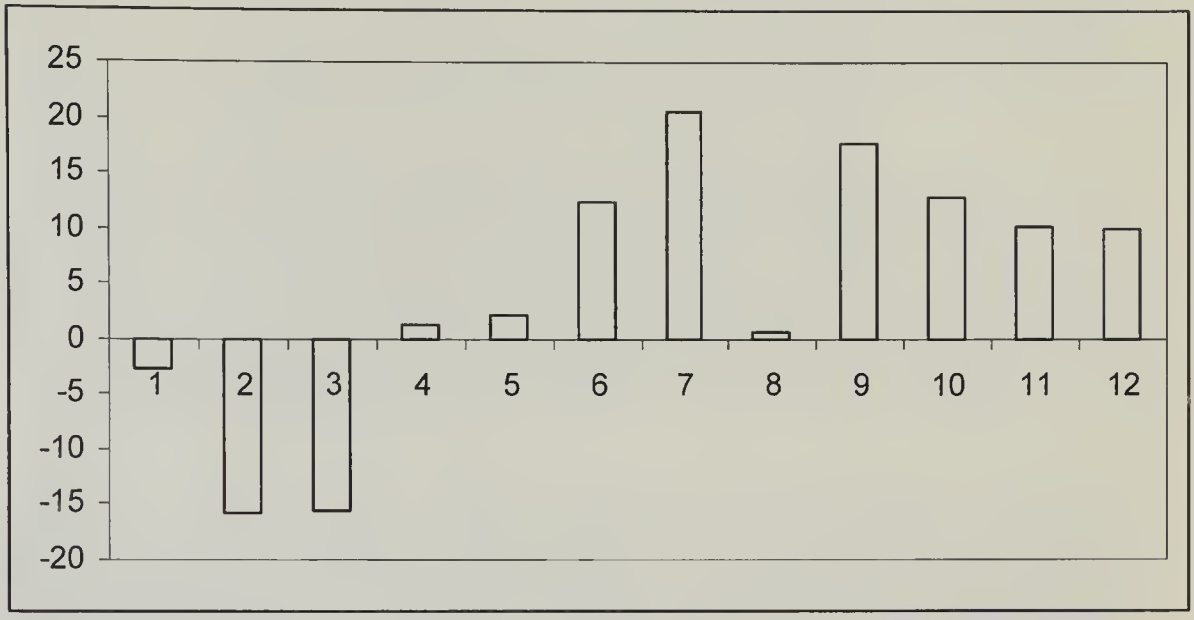

Chart 1 Monthly mean maximum temperature- percentage variation from long term average.

Monthly rainfall. Six months were wetter than the long term average, six drier. Graph 2 shows the percentage differences.

Chart 2 Monthly rainfall, percentage variation from long term average

Monthly summary 2006

	Temp	Rain		Temp	Rain
J	7.0	22	A	20.5	86
F	6.4	55	S	21.2	63
M	8.5	102	O	15.9	94
A	12.9	35	N	11.2	152
M	16.6	129	D	8.4	118
J	21.7	47	Av	14.7	955
J	25.1	49			

Table 4 2006 Monthly average temperatures and total rainfall

January The coldest since 2001, and driest since 1997. The tenth driest since 1853. Frost nights 10. Began with light easterly winds round a Baltic high with low temperatures to 9th. Low pressure and southerly winds brought a rapid rise in temperature to 18th. From 22nd a high pressure settled over the UK to the end of the month and brought light easterly winds and frosts.

February The coldest since 1996. Frost nights 7. Began cold and dry, dominated by a European high to 12th. Low pressure then took over with SW winds from 12th-17th and 20mm of rain on 15th and higher temperatures. From 18th temperatures fell as winds turned N and then E, round high pressure over Iceland.

March The coldest since 1996 and the wettest since 1998. Frost nights 7. Began with very cold northerlies round a high over Iceland, with frosts. 7th-10 saw a brief spell of warmer weather and westerly winds before east winds set in from 15th to 22nd. On 23rd low pressure in the Atlantic took charge, and strong west winds brought rain and rising temperatures which reached 15C on 30th.

April Driest since 1997. Began warm but winds switched to NE on 4th and there were five frost nights, though day temperatures remained at around 10c. From 11th W or SW winds set in and temperatures reached 16C on 21st. Winds then became light and variable for the rest of the month as high pressure dominated, and the last five days were warm and sunny.

May Wettest since 1983. Began with S winds squeezed between a Baltic high and a west Atlantic low, and temperatures reached 25C on 4th, and it remained fairly warm and sunny until 18th when a deep depression settled over the UK with strong SW winds and ten days of heavy rain. Temperature fell to 13C on 22nd-24th, and this had severe consequences for many nesting birds, especially Owls. On 29th high pressure became dominant with N winds and sunshine, but temperatures remained low.

June Hottest since 1976, sunniest since 2001. Began dominated by high pressure, with warm sunny days and light winds. Temperature reached 28C on 10th. This was temporarily broken when 17mm of rain fell on 12th, then on 18th westerly winds produced cloud but almost no rain to 24th. There was an abrupt drop in temperature on 26th when 19mm of rain fell and easterlies dominated for the rest of the month.

July Hottest since 1983, 42% more sunshine than average. Began hot and sunny then, from 5th, west winds brought 39mm of rain on 6th, cloudy skies and lower temperatures to 10th. From 13th high pressure took control, and temperatures reached a maximum of 35C on 19th with almost 15 hours of sunshine. It remained hot and dry for the rest of the month.

August. A depression produced 18mm of much needed rain on 1st, but no more fell until 18th in a fine thunderstorm. From 2nd-14th winds were generally northerly, skies cloudy, and temperatures in the low 20s. From 15th-23rd low pressure brought W or NW winds and slightly cooler conditions.

September Hottest since 1959. Began with strong warm SW winds, which switched to E from 10th, and a high pressure system over the Baltic kept conditions dull, warm and dry with variable winds to 20th. The rest of the month saw warm SE, and then, SW winds round a European high, keeping conditions dull and dry.

October Dominated by W or SW winds and dull but warm conditions to 12th. Easterlies took over round a Baltic high to 17th, and then a series of lows swept across the country from 18th-31st with moderate to strong SW winds. Temperature fell to 14C on 25th for first time since May 24th.

November Wettest since 1992. Frost nights 5. High pressure with cold E winds and clear skies brought four frost nights from 2nd-5th. A warmer spell set in with W winds on 8th and the temperature reaching 15C for the last time on 13th. It became very wet from 17th, with a continuous series of depressions and strong SW winds and temperatures around 12C, to the end

of the month.

December Frost nights 2. From 1st-15th dominated by strong warm SW winds bringing warm temperatures and wet conditions. On 16th high pressure abruptly settled over the country with light E winds and fog, and temperatures fell to 1C on 20th. There were nine days without a glimmer of sun from 18th to 26th. A low pressure over Iceland brought strong SW winds, rain and temperatures back to 12C in the last four days of the year.

Weather extremes of 2006.

Coldest day	3 Feb 0C
Hottest day	19 July 35C
Wettest day	6 July 39 mm
Sunniest days	18, 19, 23 July 14.7 hrs
Longest cold spell	1-6 March
Longest hot spell	15-27 July (13 days, bar two, at 25C+)
Longest dry spell	21 Jan to 12 Feb (22 days)
Longest wet spell	16-27 May (11 days)
Longest spell with sunshine	27June to 4 Aug (39 days)
Longest spell without sunshine	18-26 Dec (9 days)
Days with more than 10 hrs sun	36
Days hotter than 25C	27
Days colder than 5C	39
Frost nights, annual total	33 nights
Days snow lying	2
Storms	19 Mar, 27 Nov, 5 Dec

Weather Extremes in Bristol, 1853-2006

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It is often suggested that extreme weather events are good indicators of climate change, and that they are becoming more frequent. The definition of an extreme weather event is not precise, and events such as storms are not easy to define. I have examined the monthly records that I have for Bristol from 1853, for rain, and 1881, for temperature, to establish the extremes of temperature (mean maximum) and rainfall that have occurred. I analyse below first the annual extremes, then the seasonal ones and finally the monthly ones.

Annual Extremes

The hottest year was 1921 which had an average temperature of 15.6C. The hottest recent year was 2003 with 15.0C. 1915 and 1892 were the coldest years at 12.1C. The most recent cold year was 1963 at 12.3C.

The wettest year was 1882 with 1253 mm of rain. The year 2000, with 1250mm, was the next wettest. The driest was 1864 with 590. The most recent dry year was 1973 with 672mm.

Seasonal extremes

Winter. (Dec-Feb) The hottest winter was 1920 at 10.6C. The hottest recent winter was 1989 at 10.1C (the second hottest ever). The coldest winter was 1917 at 2.5C, followed by 1963 at 2.8C.

The wettest winter was 1995, with an average of 154mm a month. The driest was 1964 with 21mm.

Spring (March-May) The hottest spring was 1893 at 16.6C, and the hottest recent spring was 2003 at 14.9C. The coldest spring was 1887 at 10.4C. The coldest recent was 1996 at 11.3C.

The wettest spring was 1981 with 107mm a month. 2000 had 96mm. The driest was 1893 with 17mm. 1974 had 29mm.

Summer (June to Aug) The hottest summers were 1899 and 1976 at 23.9C. The hottest recent summer was 2006 at 22.4C. The coldest summer was 1883 at 18.0C and the coldest recent summer was 1993 at 18.7C.

The wettest was 1879 with 140mm a month. 1983 had 113mm. The driest was 1995 with 11mm.

Autumn (Sep-Nov) The hottest autumn was 1959 at 16.8C, followed by 2006 at 16.1C. The coldest was 1915 at 10.6C, and the recent coldest was 1974 at 12.4C.

The wettest was 1935 with 173mm. 2000 had 156mm. The driest was 1978 with 26mm.

Monthly extremes

These are shown in the tables giving the hottest, coldest, wettest and driest, and the most recent extremes in the years since 1970. When the actual extreme has occurred since 1970 no recent extreme is given. This occurs in seven of 48 extreme events, and these are highlighted.

	Hottest	Hottest recent	Coldest	Coldest recent
January	1916 12.5	1998 9.8	1963 0.1	1985 4.3
February	1920 12.9	1998 11.2	**1986 1.7**	
March	1948 14.2	2003 13.2	1916 6.1	1970 8.0
April	1893 17.9	2003 15.4	1887 9.4	1978 10.5
May	1901 19.6	1989 19.3	1885 11.6	1996 13.3
June	1887 25.9	2006 21.7	**1991 15.3**	
July	**1983 26.2**		1883 16.4	1974 18.5
August	1899 27.3	1995 25.5	1912 16.3	1986 17.7
September	1929 22.0	2006 21.2	1912 14.5	1974 15.6
October	1921 18.9	1995 16.8	1896 10.2	1992 10.9
November	1938 12.8	1994 12.8	1915 4.1	1993 7.9
December	1918 12.3	1979 10.5	1890 0.7	1995 4.9

Table 1 Temperature extremes, 1881-2006

	Wettest	Wettest recent	Driest	Driest recent
January	**1995 175**		1855 8	1997 11
February	1923 181	2002 151	1891 0	1971 21
March	**1981 162**		1961 4	1973 19
April	**2000 169**		1854 0	1974 14
May	1869 164	1983 150	1905 2	1991 9
June	1860 185	1991 148	1925 1	1995 12
July	1940 201	2003 139	1955 4	1999 8
August	1865 221	1992 181	1940 5	1995 7
September	1935 200	1974 200	1865 0	2003 8
October	1967 223	1987 190	**1978 4**	
November	1929 252	1992 210	1901 11	1973 41
December	1965 212	1994 180	1926 14	2001 27

Table 2 Rainfall extremes 1853-2006

Conclusions

Of 24 temperature extremes, 19 occurred in the period 1881-1943 and five since 1943. Only three events have occurred since 1970.

Of 24 rainfall extremes 8 occurred in each of the three fifty year periods starting in 1853. Only four events have occurred since 1970.

There are many other possible extreme events, including flooding, snowfall, and frost, but I do not have accurate measurements of these. Flooding is usually a result of heavy rainfall in a short time, but it is also a consequence of the canalisation of rivers, the drainage of bogs in the uplands (generally for sheep farming), and the poor maintenance of storm drains, made much worse recently by the paving of gardens.

All the local evidence suggests that weather is essentially chaotic, and that extreme events are thus randomly distributed. There is no obvious link to the warming of the climate that occurred between 1900 and 1960, or the subsequent period of cooling from 1960 to 1985.

Phenology Report 2006

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Phenology is the study of the impact of the weather on natural events, and I have looked particularly at the effects of temperature on plant development by doing a standard walk across the Downs each week when I record the plants in flower, the leafing of trees, the ripening of fruit, and leaf fall. The variation in dates from year to year can be compared with the temperature in the relevant preceding period. Establishing the normal relationship between temperature change and plant development at this latitude is vital to any understanding of the potential and actual impact of climate change in future.

2006 was a remarkable year as it began with the coldest spring since 1997, and then went on to have the hottest summer since 1995 and the hottest autumn since 1959. Table 1 compares the 2006 average temperature for each season with the long term average since 1881, and the standard deviation. The exceptional nature of both summer and autumn is clear.

	Winter	Spring	Summer	Autumn
2006	7.1	12.7	22.4	16.1
Average	7.6	12.9	20.1	14.0
Std	1.4	1.0	1.3	1.1
Difference	-0.5	-0.2	2.3	2.1

Table 1 Seasonal temperatures 2006 compared with the average since 1881 and the standard deviation. The last row shows the difference between 2006 and the long term average.

Spring events

(In the charts that follow the dates on the Y axis are give in Julian days, ie days after January 1st. It helps to remember that April 1st is Day 90, June 30th, Day 181, Nov 1st, Day 305).

Chart 1 shows the average date of 13 spring events on the Downs which have been well recorded since 1998. In 2006 winter was cold, as was March, and spring events were very late. In fact they were on average 33 days later than 2005.

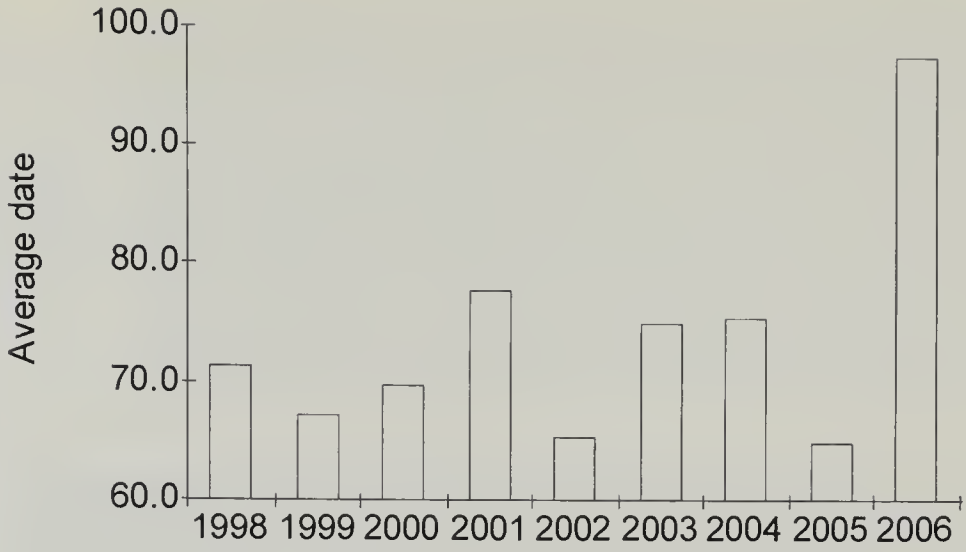


Chart 1 Average date of 13 spring events, 1998-2005

Chart 2 shows the relationship of these events to the March temperature. Roughly speaking a one degree C change in March temperature causes a six day change in the average date of events. The value for 2006 is the top left dot.

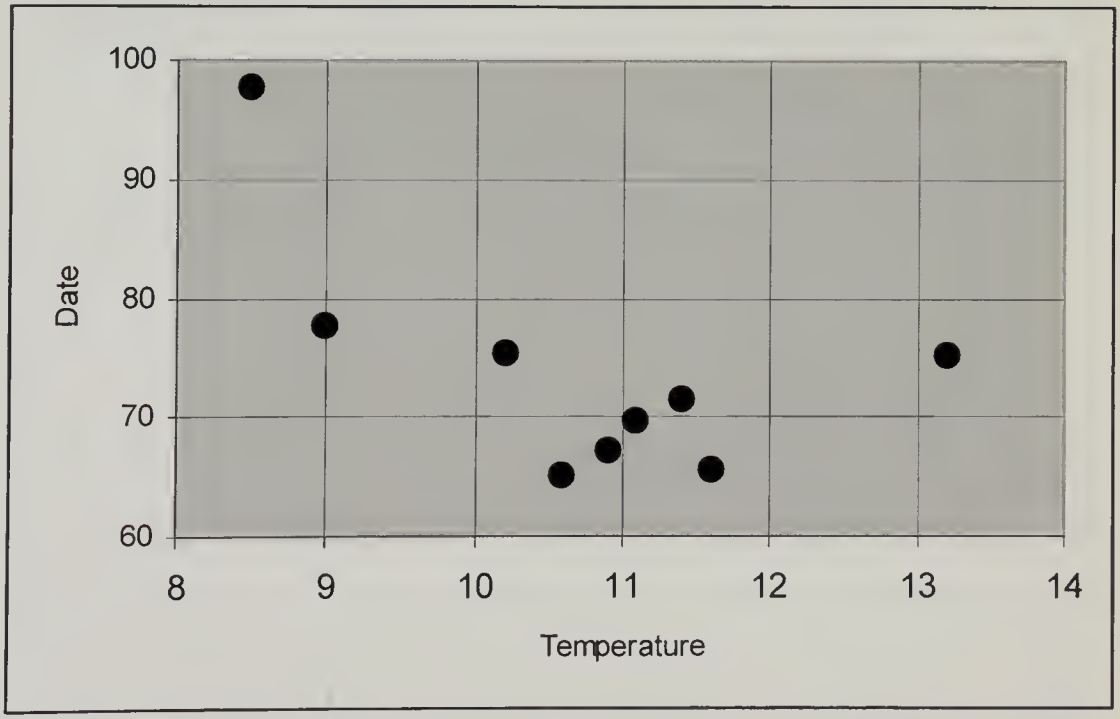


Chart 2. Relationship of March temperature to average date of spring events 1998-2006

Autumn events

Fruit ripening. Chart 3 shows the relationship between the average ripening date of 14 species since 2001 and the average of August and September temperature. In 2006, despite the exceptional July, the average date was very similar to the previous two years, and 2003 still holds the record for the earliest ripening date. The chart suggests that a one degree change in Aug/Sept temperature changes the average ripening date by five days.

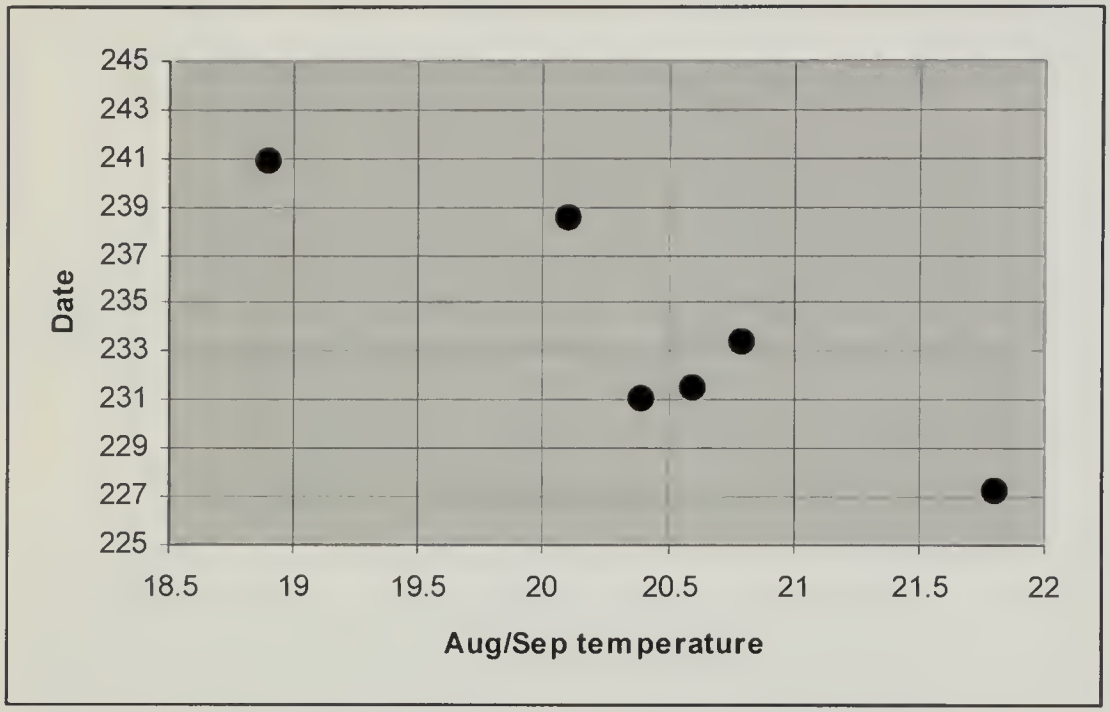


Chart 3. Ripening dates for 14 species, 2001-2006 compared with August/September temperature

Leaf fall

Chart 4 shows the relationship between the average date when 24 local tree species became bare and October temperature. In 2006 the average date was Nov 21st (Day 325), five days later than the overall average for the six years of Nov 16th (Day 320), though five days earlier than the exceptional date in 2005. The figures suggest that a one degree alteration in October temperature produces a five day change in the date of leaf fall.

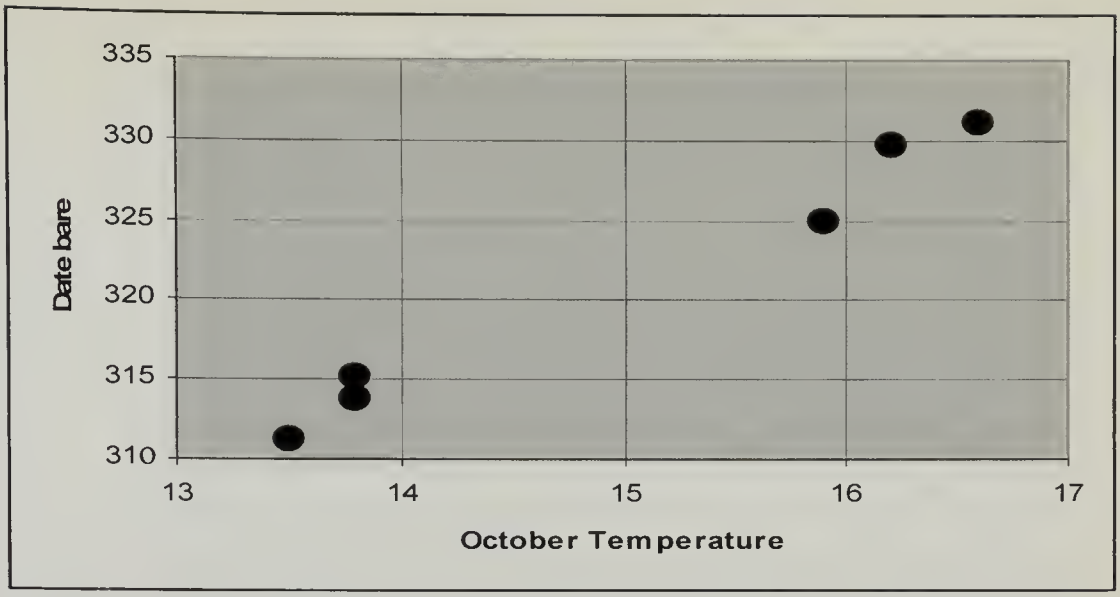


Chart 4 Relationship between October temperature and the average date of leaf fall, 2001-6

Tree active life.

By comparing the average date of bud burst with the average date of becoming bare one can calculate the average active life of tree species. This will affect the overall ring width for each year, and thus the growth rate in girth of a tree, and the strength of the buds, especially the flower buds laid down for the following year. Though most trees manage to flower every year, some do not, and this must be related to the plant's basic physiology. Furthermore the annual harvest varies every year, in part dependent upon the weather in the course of the year, and in part on the amount of blossom produced.

In 2006 the result of the late spring was that the average of 12 native species was a shortening of active life by 15 days. Beech and Rowan were almost unaffected, but Hawthorn had an active life 58 days shorter than the previous average. In 2005, the best recent year, the 12 species had an average of 241 days active life, but in 2006 only 214.

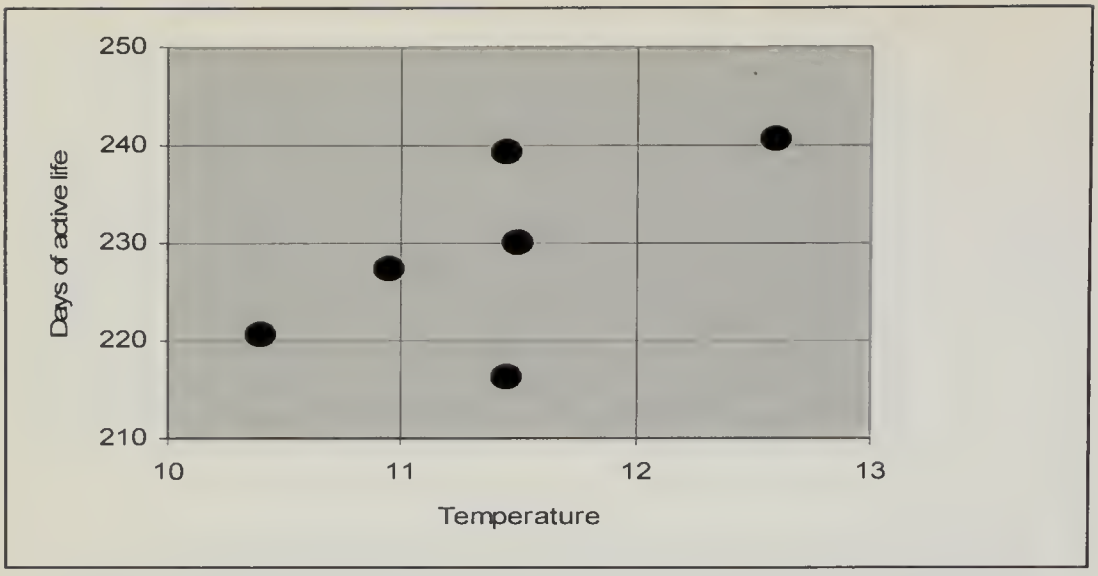


Chart 5 Relationship between the average of January and October temperature and the number of days of active life for twelve tree species, 2001-2006

Survival.

A New Year's Day count on the Downs on January 1st 2007 revealed 25 species still in flower, seven species new to this survey, which began in 2000. It increased the total number of species seen in flower at the end of the year to 34. As the autumn was the third hottest recorded since 1881 it is unsurprising that there were so many. Of the 34 only four have been in flower every New Year's Day and another four on six occasions. 14 have only been seen once, and three species are spring flowers rather than survivors. It is also remarkable that there were ten species that were not in flower in 2006 but which had been in earlier, colder, years. The chart shows the relationship of autumn temperature to the number of species in flower.

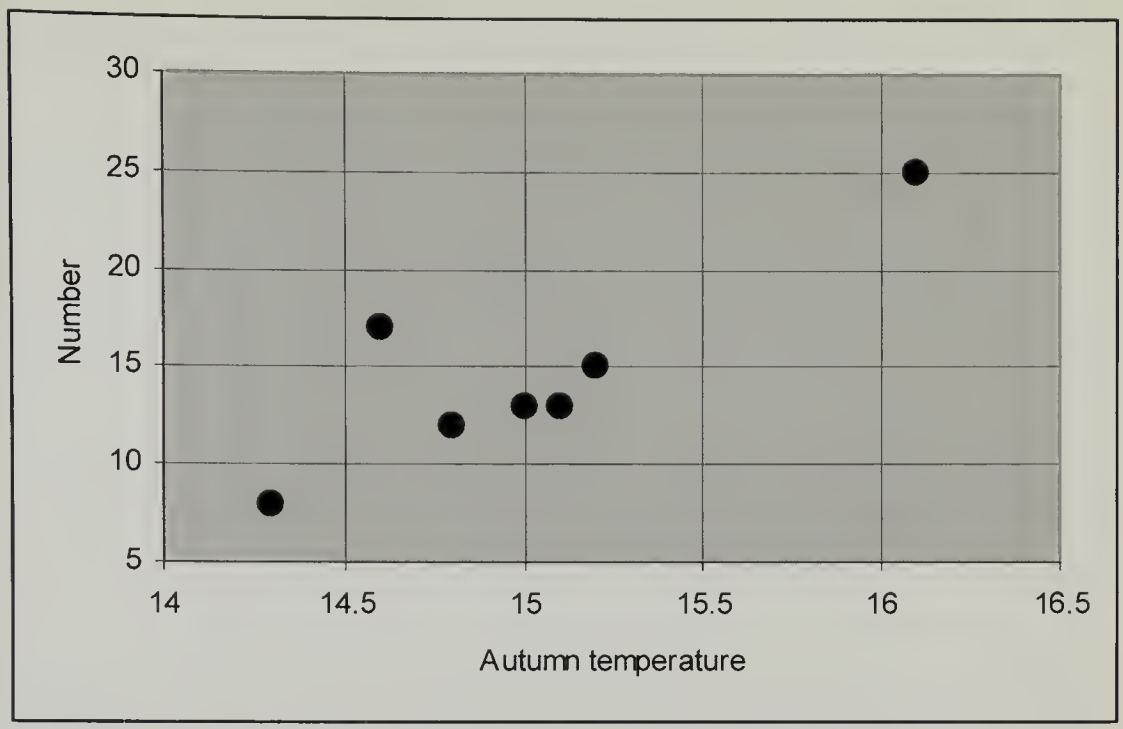


Chart 6 Relationship between the number of species in flower on the Downs each New Year's Day 2000-2006 and the autumn temperature

Plant first flowering dates.

JW White' 1912 Flora of the Bristol Region gives the months in which each species can be found in flower which he says is based on local observation. It is interesting that for Daisy he gives February to October and for Dandelion March to October because today both these species can be found in flower in every week of the year. Although the winter of 2005-6 was the coldest since 1996/97 there was no long period of frost, and both Daisy and Dandelion flowered throughout. In White's day the 20-year average winter temperature was 6.9C, whereas today it is 8.1C, and that is probably the cause of the difference. His information is the only phenological information at present available. If we are to measure the impact of climate change accurately we need to establish with greater accuracy for every species the average date when flowering starts and finishes, and the "normal" range of variation. I have calculated average first and last dates for 167 species on the Downs based on the dates I have collected since 1998. The variation between earliest and latest start dates since 1998 for 167 species is shown on chart 7. Unsurprisingly the range is greatest for early flowering species, and least for those that flower in mid summer. But temperature, and rainfall, will also affect the flowering period of each species, and there tends to be far more variation in the date at which species end flowering than in the start. This may partly be the result

of the fact that it is harder to measure the point when a species ceases flowering than when it starts, and the figures that I have accumulated may well need modification. But the average variation between earliest and latest starting dates for 167 species is 29 days, whereas that for finishing dates is 51 days. The average flowering period for these species is 93 days. Basic information of this kind can be used to establish with some precision the impact of climate change both on individual species, and on plant-life in general in the region, and to that end it would help if all plant records included a note as to whether the species was in flower or not, and if more people recorded first and last flowering dates as a matter of course.

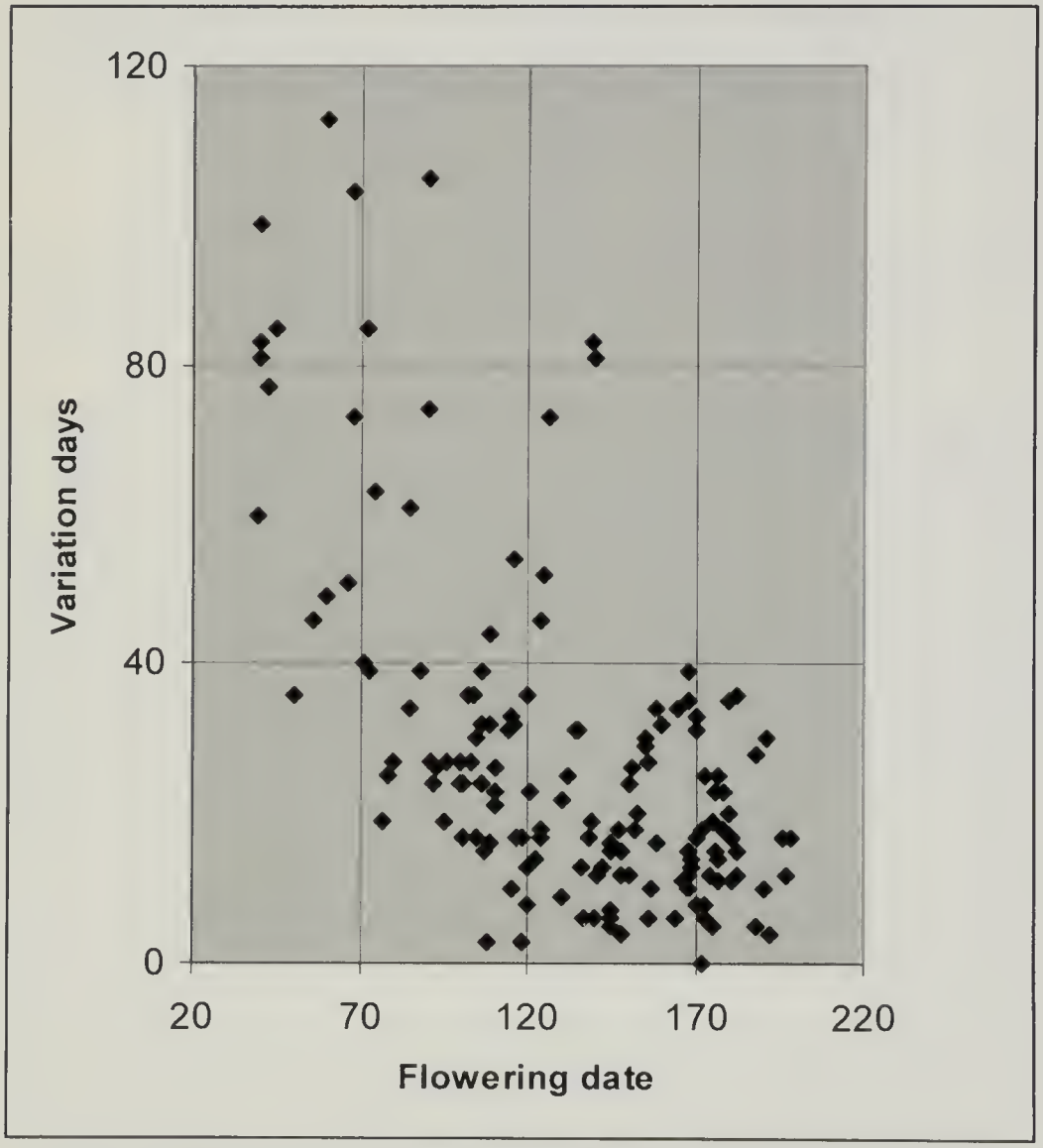
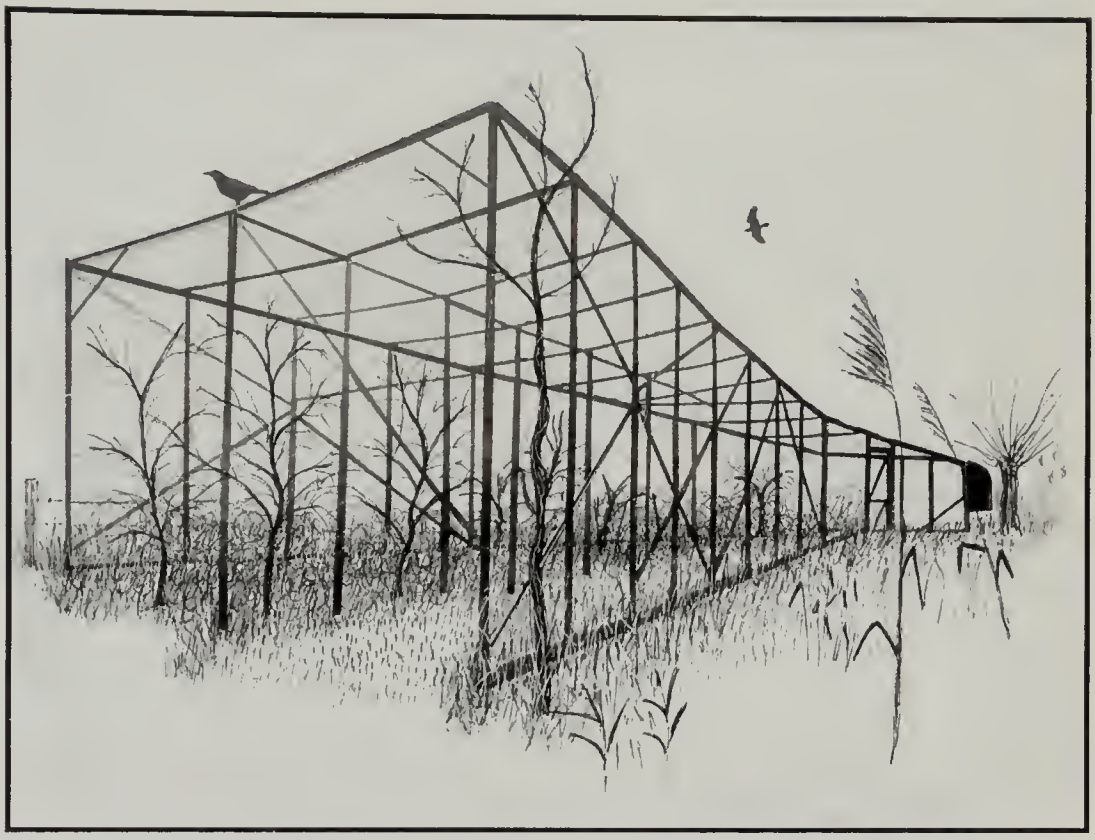


Chart 7 Relationship between average first flowering date and total variation in flowering date 1998-2006 for 167 species

A Heligoland Trap at Chew Valley Lake.

By Mike Bailey.
mike_bailey.timsbury@virgin.net



The Heligoland trap at Chew Valley Lake. December 2006.

The name for this type of large funnel trap comes from the island of Heligoland; a small German archipelago in the south-eastern corner of the North Sea. The first trap of this kind to be used for bird ringing was built by Hugo Weigold in 1919. Its design was based on the 'Thrush-bushes' utilised by the islanders to catch migrating thrushes for food. He later wrote " We constructed our original trap which proved excellent. We were able to trap all the birds and how exciting it was, to keep in our hands many birds of various species even the smallest and most delicate ones, to examine them in detail, to measure, weigh, ring, and eventually set them free." (Weigold 1956 in Schofield 2004). This led to the founding of the 'Fanggarten' or ringing garden which attracted birds by providing shelter and cover on the barren island. Nothing of the original site survives as it was completely destroyed by bombing during the Second World War.

31 Heligoland traps are thought to have been built in the U.K. The first was on Skokholm in 1933 followed by the Isle of May in 1934 and locally on Lundy in 1946. 23 of these observatory traps survive today with Fair Isle being home to eleven of them. (From Schofield 2004). Six are at coastal sites in England and the only other inland based trap that I've located is run by Tony Creasey at Catterick Garrison in North Yorkshire.

Our original plan was to build a Heligoland style trap in the Ringing Station garden with the idea that this would give us a way of catching birds when bad weather prevents the use of mist nets. The main use would have been in the winter months with the setting up of a feeding station within the trap to attract the birds.

Construction began in the autumn of 2005 but we soon realised that this was inappropriate and would not be fair to our neighbours in Herriott's Bridge Cottage, as it would obstruct their view of the lake. A second and much better plan emerged as we considered the possibility of constructing it in the nature reserve. This would give us the opportunity to use it throughout the year and hopefully catch a much wider range of species. However, before going any further, as the reserve is an SSSI, we thought it prudent to get permission from English Nature and Bristol Water. Work started in January 2006 and it was fully operational by the July.

Results:

Table 1 list the number of birds caught in the Heligoland trap from the summer of 2006 to February 28th 2007. 309 individual birds have been processed and comprises 122 new birds and 187 birds that already been rung within the reserve, having been caught previously in mist nets. In total there were 476 handlings, which represents around 10% of our catching effort.

Table 1.	Col.1.		Col. 2.		Col. 3.		Col. 4
Species	Individual		New		Already		Total
List	birds		ringed		rung		number
	caught				(retraps)		handled
Blackbird	3	=	2	+	1		3
Blackcap	5	=	5	+	0		5
Blue Tit	101	=	13	+	88		154
Cetti's Warbler	1	=	0	+	1		1
Chaffinch	47	=	27	+	20		89
Chiffchaff	6	=	6	+	0		7
Coal Tit	1	=	1	+	0		1
Dunnock	12	=	3	+	9		41
Goldcrest	2	=	1	+	1		2
Great Tit	33	=	4	+	29		47
Greenfinch	64	=	36	+	28		79
Lesser Whitethroat	1	=	1	+	0		1
Long-tailed Tit	2	=	1	+	1		2
Magpie	1	=	1	+	0		1
Mallard	4	=	4	+	0		5
Moorhen	1	=	1	+	0		1
Redwing	3	=	3	+	0		5
Reed Bunting	2	=	0	+	2		2
Reed Warbler	1	=	1	+	0		1
Robin	5	=	2	+	3		12
Sedge Warbler	2	=	2	+	0		2
Song Thrush	1	=	1	+	0		1
Stonechat	1	=	1	+	0		1
Water Rail	1	=	1	+	0		1
Whitethroat	2	=	2	+	0		2
Wren	7	=	3	+	4		10
Totals	309	=	122	+	187		476

Col. 1 The total number of individual birds caught (= Col.2 + Col. 3.)
Col. 2 Lists the number of new, un-ringed birds.
Col. 3 Lists the number of birds that already had rings i.e retraps
Col. 4 The total number of birds processed and therefore includes multiple recaptures.

Times caught	number		Species.
1	224		All other species only once
2	45		Chiffchaff, Mallard
3	24		Great Tit, Redwing
4	8		Greenfinch, Wren
5	5		Blue Tit
6	2		Dunnock, Robin
11	1		Chaffinch
Total	309		

Table 2 Number of times caught.

The local birds soon 'catch on' and seem to quickly learn how to avoid being caught. The bait is placed in the middle of the trap and the ones 'in the know' fly out over our shoulders when they see us approaching. Table 2 gives an analysis of the number of birds and the maximum number of times that a particular species has been caught.

Of the 309 birds of 26 species, 224 birds of 16 species were only seen once. 45 birds were handled twice, 24 three times, eight, four times and five, five times. A Dunnock and a Robin were caught on six occasions possibly because we operate within their territories. The record, however, goes to a Chaffinch who is remarkably trap tolerant, (or unintelligent), as she's been processed on eleven occasions! This level of recapture is similar to the number of retrapped birds that one would get at a feeding station using mist nets as a means of catching the birds.

Although the trap has only been in use for about 8 months it has proved to be very successful and has caught Magpie, Mallard, Moorhen and Water Rail; species that we rarely get in mist-nets. Part of the Ringing Station's function is to provide a training programme for ringers and the Heligoland trap is especially helpful to those who are handling birds for the

first time. It was also found to be a useful and an interesting catching method that we could demonstrate to the ringers who attended our annual ringing course at the end of July last year. Ringing today is an important tool in following population trends but its original purpose, the study of migration and bird movements is still very relevant. To date we have not had any of our 'Heligoland' birds recovered away from the lake, nor have we captured a bird that was ringed elsewhere, but no doubt that red letter day will come.

Acknowledgements: We would particularly like to thank The Bristol Natural History Society for their donation of £300 from their Conservation Fund which went a long way towards covering the construction cost.

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Avon BAP Update

M Hamilton
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Hello! For those of you who don't know me, I am Matt Hamilton the new(ish) Avon BAP Coordinator. I took over in March from Lucy Rogers, whose previous hard work in this role has seen her promoted to Head of Biodiversity at the Avon Wildlife Trust. I look forward to meeting many of you over the coming months.

For those of you who aren't familiar with my role, the Avon Biodiversity Action Plan or BAP is the over-arching conservation strategy for the Avon area. The BAP was produced on behalf of the Avon Biodiversity Partnership, a group that consists of a wide range of organisations, businesses, and community groups including the Bristol Naturalists' Society (for more details see our website www.avon-biodiversity.org.uk). My role is to facilitate the implementation of the BAP by the Avon Biodiversity Partnership.

But enough introductions – this year has been a very exciting one with over £140,000 of funding bought in to help deliver the targets for nature conservation set in the BAP, and two members of staff appointed to drive forward major projects.

The first of these, Mark Smith, is our Grasslands Project Officer who is hosted by the Farming and Wildlife Advisory Group (FWAG). The aim of the FWAG led Grasslands Project is to restore and secure long-term management for two grassland sites by clearing scrub, erecting fencing and finding graziers. As I type, stock-proof fencing is being installed on both sites and areas of scrub mapped in preparation for their removal next winter. Graziers have already been found for both sites, so we are on course to have two large areas of unimproved grassland back under traditional management by this time next year. The project is funded by the SITA Enriching Nature Programme, Natural England and BANES Council and is designed to be a pilot for an even grander and more landscape-scale project in the future.

Our second new face is Lydia Robbins, the Pondways Project Officer. Based at the Avon Wildlife Trust, Lydia has already recruited and trained over thirty volunteers who are currently out surveying ponds across Avon. These surveys will provide valuable information on the condition of ponds in Avon as well as the distribution of amphibians (especially Great Crested Newts). Such data is lacking at present and will be crucial in informing future conservation efforts.

Two more exciting developments this year have been the launch of our Wildlife Champions project with Bristol Zoo Gardens (designed to inspire members of the public to champion a local species or habitat) and the development of the Avon BAP Atlas. The latter is an ambitious and groundbreaking project undertaken in partnership with BRERC that examines the Strategic Nature Areas identified by Nature Map and identifies areas within them that have high potential for restoration to priority habitat. When completed the BAP Atlas will enable us to target our conservation efforts where they will have most effect. The excellent work of BRERC on this project deserves a mention as other counties in the South West are now looking to follow our lead.

The results of last year's Bristol Birdwatch, a collaboration between the BTO, BOC, BNS, Bristol City Council, AWT and ABP, have now been analysed. In a change to the previous five years, participants last year were also asked to record when they heard Tawny Owls from their houses. The results were remarkable as Tawny Owls were recorded on 227 of the 1700 forms received. Taking into account the time of year the calls were heard and the size of tawny owl territories, Richard Bland of the BTO estimates a possible total of 75 breeding pairs across Avon – an excellent result for a species notoriously difficult to monitor.

The partnership is involved in many other things as well as the projects it undertakes, I have been working with the Avon Wildlife Trust and other groups to try and ensure that biodiversity is included in the Local Area Agreements and Community Strategies currently being written and reviewed. The partnership has also been continuing to grow in numbers and work with new people – this increases the pool of expertise that we can draw upon as well as our area of influence.

Looking to the future, the focus groups within the Avon Biodiversity Partnership have identified several key projects for the next couple of years to help meet the targets in the Avon BAP. This year we will be looking to develop and find funding for projects on veteran trees, arable farmland, urban gardens and Water Voles. As always, we will be heavily reliant on volunteer support and action to complete these projects. Our current Pondways Project would not work without the thirty volunteers who are surveying ponds throughout Avon, and volunteers, especially those with expertise, will be vital if our urban gardens and veteran tree projects are to be successful. I will be in contact again with BNS members once we have funding secured for these projects, but please feel free to get in touch in the mean time if you would like to know more.

Bristol Mammal Report 2006

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INTRODUCTION

The intention of this mammal report is to be a wide-ranging review of the records and studies of mammals in and around the Bristol area and to report on significant issues and events affecting British mammals in 2006. The number of one-kilometre squares in which those species were positively recorded is given in brackets after the scientific name, followed by the number of one-kilometre squares for 2000 to 2006. Where no grid reference was provided, the record is not included in this total. The former county of Avon covers an area of approximately 1300 square kilometres, and so the number of 1 km squares for which records have been received gives an indication of the abundance of each species. Where given, all grid references are for the 100 km grid square ST. The differences between the years is likely to be due to changes in numbers and locations of recorders rather than changes in mammal abundance or distribution. Provided the submitter of a record gives permission, all records are submitted annually to the Bristol Regional Environmental Records Centre (BRERC).

INSECTIVORA (Hedgehogs, Shrews and Moles)

Hedgehog (*Erinaceus europaeus*)

Year	2001	02	03	04	05	2006
1-k Squares	38	45	26	26	39	14

There were 20 road casualty records in 2006, the second lowest yearly count in eleven years. Seven of these were from a single 1-km square in Pilning (5585). There were no records for January-March and December. Eleven years of data and 555 records of road casualty Hedgehogs show two main peaks, a smaller peak in May when most Hedgehogs have emerged from hibernation and a larger peak in July/August when the young of the year disperse (Fig. 1). Hedgehog road casualties have now been recorded in every month of the year except February.

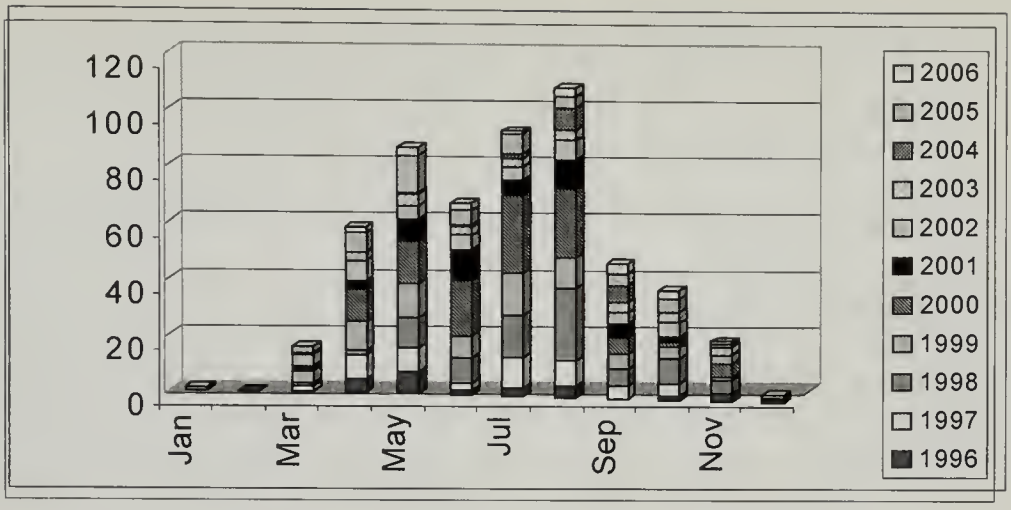

Figure 1. Number of Hedgehog Road Casualty Records per Month 1996-2006.

The Mammals on Roads Survey run by the People's Trust for Endangered Species has detected a decline in Hedgehogs across England, particularly in the east. There are indications of a decline of 20% from 2001 to 2004 (Tracking Mammals Partnership - UK Mammals Update 2006). Interestingly our figures for the same period also show a 58% decline in road casualty Hedgehogs (2001 – 45, 2002 – 47, 2003 – 28 and 2004 – 19), and a 32% decline in the number of squares in which they were observed. Recorded by RB, JMars, JMart, JR, DT, MT,

Mole *Talpa europea*

Year	2000	01	02	03	04	05	2006
1-k Squares	151	69	63	56	63	90	71

The vast majority of records were of Mole hills, generally the only evidence that Moles are in a particular area. Recorded by RB, JB, PC, PF, JMart, EN, J&SP, JR, TS, DT.

Common Shrew *Sorex araneus*

Year	2000	01	02	03	04	05	2006
1-k Squares	1	3	4	5	2	6	6

Records included two killed by a cat in Stapleton, and one caught alive in a *Longworth* trap at Clapton Moor Nature Reserve. Records from PF, JR, TS, DT.

Water Shrew ***Neomys fodiens***

Year	2000	01	02	03	04	05	2006
1-k Squares	0	0	2	2	2	0	1

A single record from Montpelier (5974) of one killed by a cat, from ES.

CHIROPTERA (Bats)

Bechstein's Bat ***Myotis bechsteinii***

Year	2000	01	02	03	04	05	2006
1-k Squares	0	0	1	1	0	0	1

A single record for the year – the first record of a Bechstein's Bat in North Somerset - in a disused mine. (Wild Times June 2006 – Avon Wildlife Trust).

Serotine ***Eptesicus serotinus***

Year	2000	01	02	03	04	05	2006
1-k Squares	0	0	2	2	0	1	1

Two heard on bat detector at Ashton Court 20 July.
Record from JMart/DM.

Noctule ***Nyctalus noctula***

Year	2000	01	02	03	04	05	2006
1-k Squares	1	3	4	4	4	0	1

One heard on bat detector and seen at Ashton Court on 20 July.
Record from JMart/DM.

Common Pipistrelle ***Pipistrellus pipistrellus*** **and Soprano Pipistrelle** ***Pipistrellus pygmaeus (4,9,6,5,12,4+,3)***

Year	2000	01	02	03	04	05	2006
1-k Squares	3	4+	12	5	6	9	4

Records from four 1-km squares. Single Common and Soprano Pipistrelles

heard on bat detector at Ashton Court on 20 July; dead Soprano Pipistrelle at Lower Littleton on 7 February and unidentified Pipistrelles at Pilning (April-Oct) and Eastville (16 April).
Records from JMart, RM, JR.

Bats in the News

'Relocation plan for bat colony' (Clevedon Mercury 5 Jan 2006). A disused flat at Tyntesfield, currently the home of 90 Lesser Horseshoe Bats, was the subject of a planning application to turn it into staff accommodation. Following advice from expert ecologists and the Avon Bat Group, the bats will be moved under license to a new purpose-built loft above a wood store next door.

'Rare bat baffles university experts with 100-mile flight' (Bristol Evening Post 30 December 2006). A Greater Horseshoe Bat which was born in the Woodchester Park colony and turned up in a roost in Dorset, 100 miles away three months later amazed experts by both the length and speed of its journey. The bat was discovered at a roost at Boar Mill on the Isle of Purbeck by Bristol University PhD research student Jon Flanders.

LAGOMORPHA (Rabbits and Hares)

Brown (European) Hare *Lepus europaeus*

Year	2000	01	02	03	04	05	2006
1-k Squares	34	11	10	24	6	10	12

Four seen at Uphill (3157) on 22 April, two seen at Elm Farm, Burnett (6566) on 28 March and two at Blagdon Lake (5059) on 17 December. All other records were of single animals. Records from RA, RB, PC, PF, PH, JMart, J&SP, DW.

Rabbit *Oryctolagus cuniculus*

Year	2000	01	02	03	04	05	2006
1-k Squares	105	19	36	52	68	76	48

Records from RB, BNMG, PC, EN, J&SP, JR, DT, DW.

RODENTIA (Rats, Mice, Voles and Squirrels)

Brown Rat *Rattus norvegicus*

Year	2000	01	02	03	04	05	2006
1-k Squares	17	6	13	9	9	7	6

Records from RB, JR, TS.

Grey Squirrel *Sciurus carolinensis*

Year	2000	01	02	03	04	05	2006
1-k Squares	77	50	37	59	62	83	60

Richard Bland has been counting Grey Squirrels on a weekly basis in his 1-km square local patch (5673 centred on Clifton) for the past six years. His results are summarised in Figure 2. These show a very sharp increase from about weeks 36 to 40 (mid September to mid October) with numbers then declining to 'normal' levels by week 48 (late November). This peak is likely to coincide with the autumn dispersal of that year's young together with some of the adults (Corbet and Harris, 1991).

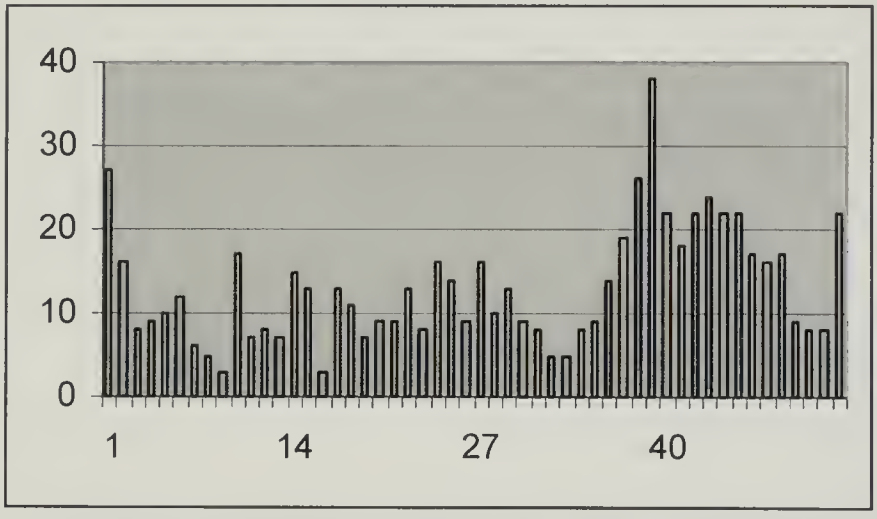

Figure 2. Cumulative weekly grey squirrel counts for ST5673 for the years 2001-2006.

48 timed winter walks have produced 70 squirrels at a rate of 1.35/hr, cf 2.84/hr in 2005. During the summer April to June counts on bird walks were 19 on 101 walks of 68 hours, a rate of 0.28/hr.

In his garden in 2005 the average was 2.7 squirrels seen per week. In 2006 the average has been 3.1 a week. There were very high levels right through to the end of June, then almost none. In the last quarter of 2006 just 24 squirrel-days were recorded compared with 84 in 2005, which presumably reflects the glut of acorns and beech mast in 2006.
Records from RB, PBow, JB, PF, JMart, EN, J&SP, JR, DT, TS.

'The Red has lost – so accept the Grey' - Stephen Harris highlighted the problems and costs of attempting to eradicate Grey Squirrels in order to save the native Red Squirrel *Sciurus vulgaris* in an article in the September edition of *BBC Wildlife 24 (9)*. He postulates that it would be far more cost-effective to conserve populations of Red Squirrels on islands such as the Isle of Wight, Brownsea/Furzey, Anglesey and Arran where they are already present. The potential for introducing Red Squirrels to islands such as Mull is also suggested.

Water Vole *Arvicola terrestris*

Year	2000	01	02	03	04	05	2006
1-k Squares	0	2	2	2	1	2	4

Droppings and feeding stations seen at the Avon Wildlife Trust Reserve at Avonmouth Sewage Works on 30 September. In addition Water Voles have been sighted around Portbury, (the introduced population), a record of one at the Avon Wildlife Trust reserve at Walborough and a sighting at Kenn Moor. (Wild Times June 2006 – Avon Wildlife Trust). Records from BNMG & Avon Wildlife Trust

Bank Vole *Clethrionomys glareolus*

Year	2000	01	02	03	04	05	2006
1-k Squares	4	1	6	5	1	3	3

Records included an individual live-trapped and released three times from inside a house at West End, Nailsea having chewed through a telephone cable twice and an individual live-trapped at Clapton Moor Nature Reserve in November. Records from DT, MT.

Short-tailed Field Vole ***Microtus agrestis***

Year	2000	01	02	03	04	05	2006
1-k Squares	2	2	7	5	1	3	4

An interesting sighting of Gulls, Magpies and Kestrels hunting voles in salt marsh on an incoming tide at Chittening Warth. Records from JMart, J&SP, JR, TS.

Common Dormouse ***Muscardinus avellanarius***

Year	2000	01	02	03	04	05	2006
1-k Squares		0	1	1	0	0	5

Records from Lower Woods (7486) (Dormouse tube survey) and a single Dormouse hibernating under leaves in a garden in Wraxall (4872) in February. (See '*Dormice on your Doorstep*' below). Records from JB, JMart.

'*Tunnel of love unites Dormice*' (Bristol Evening Post 7 August 2006). A 20 metre long aerial tunnel has been constructed over a quarry road in Cheddar to re-unite a colony of Dormice. The structure comprises a wire mesh tunnel lined with twigs and moss 10 metres above the ground and it is hoped that Dormice will move through it to new habitat (and Dormice) across the road.

The '*Dormouse on your Doorstep*' project reported on their recent survey work in their December 2006 newsletter. 1,300 nest tubes were put up in hedges and woods in Bath & North East Somerset and South Gloucestershire. 90 volunteers checked the tubes every six weeks but disappointingly, but not surprisingly, no Dormice nested in them. Two guided walks during the autumn found evidence of Dormice (nibbled nuts) in a hazel hedge/green lane at East Harptree on the Mendip border (two records 5555 & 5655) and on the edge of woodland at Hawkesbury Upton on the Gloucestershire border (one record 7987). The Hawkesbury record is within 3-4 km of Lower Woods/Wetmoor – a stronghold for Dormice in this area and where, in 2006, seven Dormice were found in the 50 Dormice boxes located there.

Wood Mouse (Long-tailed Field Mouse) ***Apodemus sylvaticus*** Plate 9

Year	2000	01	02	03	04	05	2006
1-k Squares	6	7	5	9	3	7	5

Ten individuals were live-trapped (in *Longworth* live-capture traps) in hedgerows at Clapton Moor Nature Reserve in November. Records from:- JMart, J&SP, JR, TS, DT).

Harvest Mouse ***Micromys minutus***

Year	2000	01	02	03	04	05	2006
1-k Squares	0	1	0	0	0	1	1

One caught in a *Longworth* trap Bleadon Level in November. Record from LR.

House Mouse ***Mus domesticus***

Year	2000	01	02	03	04	05	2006
1-k Squares	3	4	1	3	1	3	2

House mice reported regularly in most months in Stapleton and Pilning. Records from JR, TS.

SMALL MAMMAL STUDIES

A small mammal trapping exercise was undertaken at the Avon Wildlife Trust's Clapton Moor Nature Reserve in November as a follow-up to a similar study undertaken in 2002 (Trump, 2003) and in 2005.

100 *Longworth* live-capture traps were set in five of the six field margins/hedgerows surveyed in 2002 and 2005. One trap line was not used (one along a water-filled ditch as there was no vegetation cover – the ditch having been recently cleaned out). The traps were set to catch for two nights with all individuals caught being uniquely marked so that they could be identified if recaptured. 12 individuals of three species were trapped (Wood Mouse, Bank Vole and Common Shrew). This compares with 48 of three different species in 2005 and 52 individuals of four different species in 2002. As in 2002 and 2005, the vast majority of captures (83%) were of

Wood Mice (96% in 2005, 79% in 2002). The dramatic drop in numbers of captures (see Figure 3) is likely to be because there was a full moon on the second of the trap nights potentially rendering the small mammals more vulnerable to being preyed on by owls (Trump, 2003).

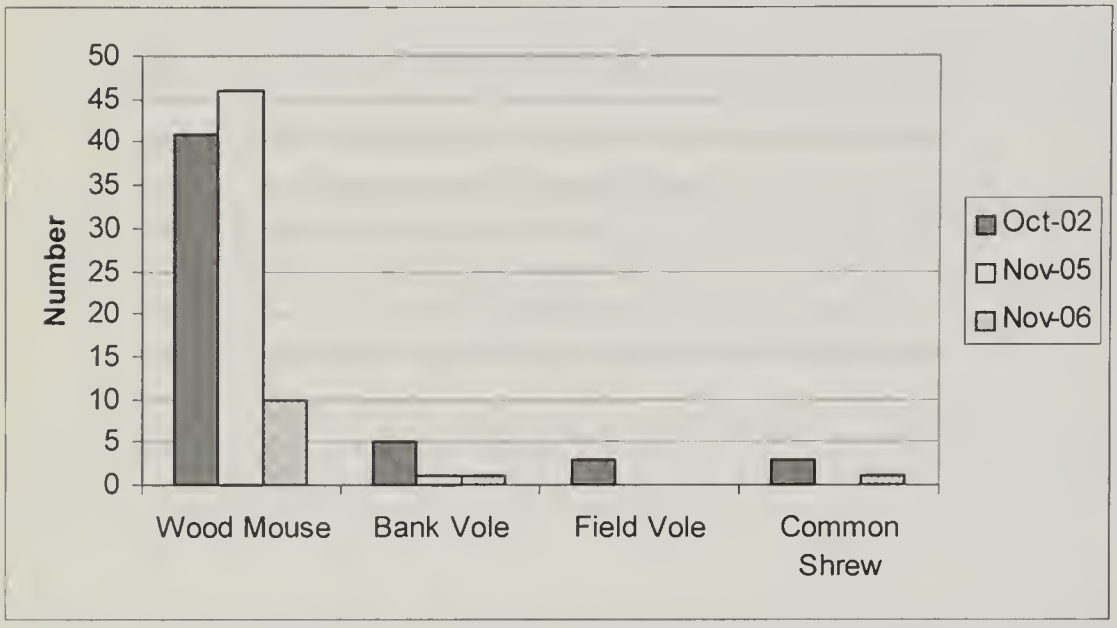

Figure 3. Small mammals trapped in hedgerows/field margins at Clapton Moor Nature Reserve autumn 2002, 2005 and 2006.

CETACEA (Whales, Dolphins and Porpoises) and PINNIPEDIA (seals)

Harbour Porpoise *Phocoena phocoena*

Year	2000	01	02	03	04	05	2006
1-k Squares	0	0	0	0	1	0	1

One reported from Wick Warth/River Yeo (3666) on 21 April. Record from Clevedon-web.

Grey Seal *Halichoerus grypus*

Year	2000	01	02	03	04	05	2006
1-k Squares	0	0	1	0	0	5	3

Individuals seen off Oldbury Power Station (6094) on 23 September, off New Passage (5486) on 11 May and 7 August and Severn Beach (5385) on 21 August. Records from PH, PB.

CARNIVORA (Carnivores)

American Mink *Mustela vison*

Year	2000	01	02	03	04	05	2006
1-k Squares	3	0	2	0	1	2	3

Records from West End Nailsea, Weston Moor and Channel View Farm. Records from Clevedon-web, J&SP, MT.

Stoat *Mustela erminea*

Year	2000	01	02	03	04	05	2006
1-k Squares	10	4	3	1	0	4	4

Records from Weston Moor, Chew Valley area, Charlton Field, Oldbury Power Station. Recorded by JA, PH, J&SP, DW.

Weasel *Mustela nivalis*

Year	2000	01	02	03	04	05	2006
1-k Squares	10	3	7	6	4	7	6

Records from West End Nalsea, Bradley Stoke, Marshfield, Chew Valley area, Lower Littleton and Oldbury Power Station. Recorded by RB, PC, PH, RM, DT, DW.

European Polecat *Mustela putorius*

Year	2000	01	02	03	04	05	2006
1-k Squares		2	2	0	0	1	1

A single record of one run over on the A403 at Redwick (5586) on 19 September from HB.

Otter *Lutra lutra*

Year	2000	01	02	03	04	05	2006
1-k Squares	24	2	25	19	28	36	28

Records from Bristol Avon Otter Survey, and North Somerset Otter Group, AOS, NSOG.

Otters in North Somerset, summarised from the North Somerset Otter Group's newsletter winter 2006 nslmassistant@avonwildlifetrust.org.uk

The NSOG August survey data recorded otter activity along the River Kenn, Parish Brook, Oldbridge River and at six sites along the Congresbury Yeo. In all 26% of sites surveyed were positive for Otter activity. In November Otter activity was again recorded along the Congresbury Yeo, Parish Brook and at one site on the Middle Yeo. In all 17% of sites surveyed were positive for Otter activity.

Otters on the Bristol Avon - information summarised from the Bristol Avon Otter Survey newsletter of March 2007.

Bristol Frome

Winterbourne Down (6579) – spraints.

By Brook

Fountain Wood weir (8475) – spraints; Common Hill weir (8374) – spraints; Drewitts Mill (8369) – spraints; Box Mill (8268) – spraints; Shockerwick Bridge (8068) – spraints; Bathford Bridge (7867) – spraints.

Corston Brook

Upper Lake (6964) – spraints; A4 Road Bridge (6965); Railway bridge (7065) – spraints and digging.

Mells Stream

Edford Wood (6648) – spraints; Mells Bridge (7248) – spraints and padding; Mells Pond (7348) – spraints.

River Avon

Lockkeeper, Keynsham (6569) – spraints and padding.

River Boyd

Old Mill Weir (6871) – spraints.

River Chew

Denny Lane and Flume (5761) – spraints and padding; Stanton Drew Bridge (5963) – spraints and padding; Bye Mills (6163) – spraints and padding.

Bath Frome

Spring gardens (7749) – spraints, padding and digging.

Otters were seen at various locations during the year; including at Claverton Island on the River Avon upstream of Bath, on the River Avon downstream of Bath, on Midford Brook and on the River Frome at Freshford. An Otter was run over near Stanton Drew on 21 November.

Badger *Meles meles*

Year	2000	01	02	03	04	05	2006
1-k Squares	77	42	50	31	37	48	29

There were 26 road casualties recorded in every month except June.
Records from the following RB, JMars, EN, J&SP, JR, TeS, DT, MT.

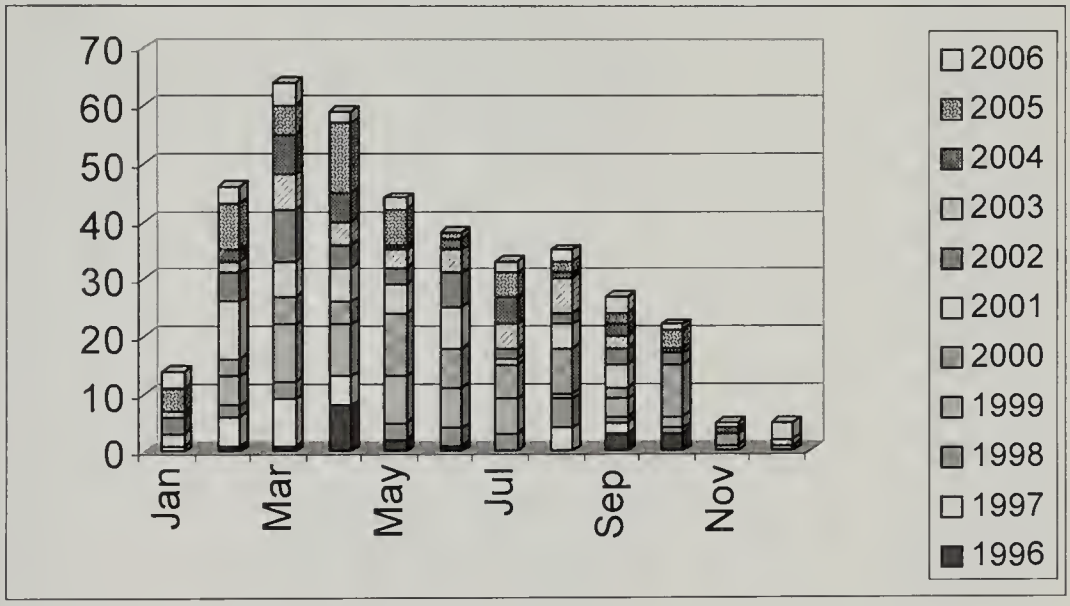

Figure 4. Number of Badger Road Casualty Records 1996-2006.

Eleven years of Badger road casualty figures with 392 records to date show a large peak around March/April (peak breeding season) with perhaps an indication of a smaller peak in August (dispersal of young) (Fig 4). There are few records between November and January. This is the time of year when Badgers are at their least active with the pregnant females underground in their setts prior to giving birth to cubs between January and March.
Since records of road casualty Badgers were recorded on a regular basis (from 1996), a number of 'hot-spots' are apparent:

1–km square	Dead Badgers	Location/Notes
4169	**6**	M5 near Clevedon, esp the bridge at ST414699
4170	**4**	M5 junction 20 (Clevedon)
4271	**9**	M5 near Clevedon Court
4369	**3**	Minor road across Kenn Moor
4469	**4**	Minor roads at west End Nailsea
4673	**4**	M5 near Clapton Court
4971	**3**	B3130 Wraxall
4972	**4**	B3128 Wraxall
4975	**3**	A369/M5 at Portbury
5072	**3**	B3128 Wraxall
5269	**9**	A370 Cambridge Batch (LA Bypass)
5369	**9**	A370 Barrow Wood (L A Bypass)
5469	**4**	A370 Long Ashton (bypass)
5471	**5**	B3128 at Ashton Court
5472	**5**	B3129 Ashton Court/Beggar Bush Lane
5484	**6**	A403/M49 Severn Beach
5563	**3**	B3130 near Winford
5570	**3**	A370 Long Ashton (bypass)
5571	**4**	A370/B3128 LA (bypass)/Bower Ashton
5585	**4**	A403/B4055/B4064 Pilning
5587	**3**	A403 north of Northwick
5781	**3**	B4055 south of Easter Compton
6469	**5**	A4 Keynsham Bypass
7172	**3**	A420 Wick
7476	**4**	A46 Dyrham Park
7757	**4**	B3110 Hinton Charterhouse
7775	**3**	Minor road near West Littleton

Table 1. Numbers of road casualty Badgers per 1-km square (1996-2006)

A further 54 1-km squares had 2 road casualty Badgers and 135 1-km squares had 1 road casualty Badger.

The results give an indication of the most hazardous places for Badgers (and for road users) but are likely to be biased towards the routes driven by the regular Badger road casualty recorders. This is particularly true of the roads around Nailsea, the M5 and the A370 where your county mammal recorder lives with five road casualty badgers reported.

Which were the most dangerous roads for Badgers in 2006?

Road Name/ Number	*Location (in 'Avon')*	*2006 total. "2005,04 in brackets*
M4	Tormarton to Second Severn Crossing	0 (1,0)
M5	Falfield to Loxton	2 (1,1)
A4	Avonmouth to Batheaston	0 (1,0)
A37	Temple Meads to Farrington Gurney	1 (1,1)
A38	Falfield to Churchill	2 (1,1)
A39	Corston to Hallatrow	0 (1,0)
A362	Farrington Gurney to Radstock	2 (0,1)
A368	Banwell to Marksbury	0 (2,1)
A369	Bower Ashton to Portishead	0.(1,0)
A370	Ashton Gate to East Brent	3 (4,5)
A46	Starveall to Bathampton	1 (0,1)
Old A46	Lambridge (Bath)	0 (1,0)
A403	Avonmouth to Aust	3 (5,1)
A420	Bristol to Marshfield	0 (1,0)
B3110	Bath to Hinton Charterhouse	0 (1,1)
B3114	Chew Magna to Chewton Mendip	2 (0,0)
B3124	Clevedon to Portishead	0 (1,0)
B3128	Bower Ashton to Stone-edge-batch	0 (3,0)
B3129	Abbots Leigh to Flax Bourton	1 (0,0)
B3130	Pensford to Clevedon	0 (2,3)
B4055	Shirehampton to Pilning	0 (4,1)
B4058	Eastville to Charfield	1 (0,0)
Unspecified	Chew Valley area	0 (9,0)
Minor roads	Various locations	8 (9,9)

Table 2. Numbers of road casualty Badgers on roads in the former county of Avon in 2006. (2005 and 2004 in brackets).

The most hazardous roads appear to be the A403 (Avonmouth to Aust) and the A370 (Ashton Gate to East Brent) with three road casualty Badgers reported in 2006 (Table 2). 12 Badgers have now been run over on the A370 in three years in the three years 2004-6.

Badgers in a Pilning Garden

Jeff Rawlinson once again reported on the nocturnal activities of Badgers in a large rural garden at Pilning (5585). Figures 5 and 6 summarise the numbers of Badgers seen in his garden in 2004 and 2005 (detailed Badger counts ceased in early August 2005 – hence the apparently abrupt 'departure' of Badgers from the garden). The counts for 2006 (fig 7) are very similar to those of 2005. Cubs were reported for the first time on 11 June with two adults being accompanied by three cubs.

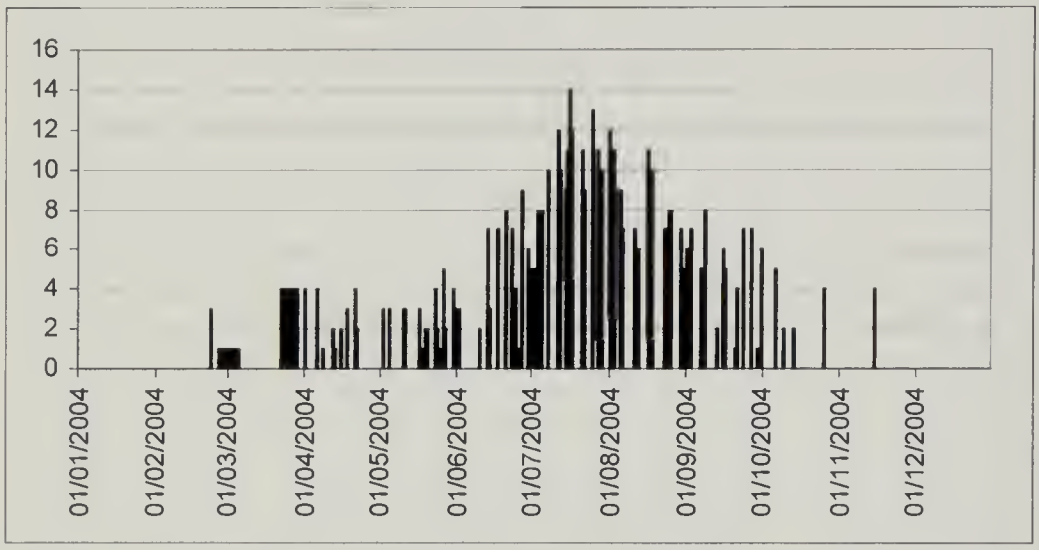

Figure 5. Numbers of Badgers seen in a Pilning garden in 2004

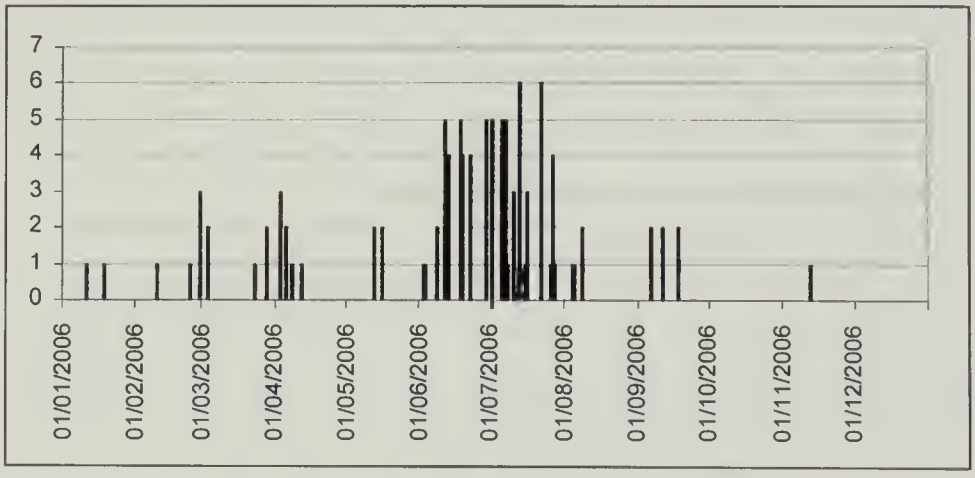

Figure 6. Numbers of Badgers seen in a Pilning garden in 2005

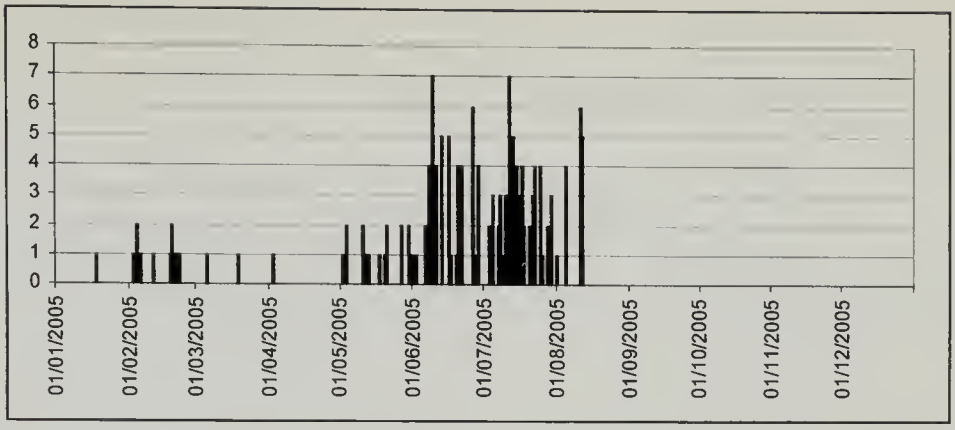

Figure 7. Numbers of Badgers seen in a Pilning garden in 2006.

Fox *Vulpes vulpes*

Year	2000	01	02	03	04	05	2006
1-k Squares	71	35	39	48	38	47	43

Foxes found within the 'City and County of Bristol' boundaries in the following 1-km squares:- 5379, 5579, 5673, 5676, 5773, 5775, 5776, 5778, 5876, 5968. Records from RB, JB, PC, PF, PH, J Mart, RGM, EN, J&SP, JR, DT, MT, DW, MW-S.

ARTIODACTYLA (Deer)

Red Deer *Cervus elaphus* No records for the year outside deer parks and deer farms. Plate X

Roe Deer *Capreolus capreolus*

Year	2000	01	02	03	04	05	2006
1-k Squares	51	20	27	33	26	33	36

Groups of three or more seen at the following locations:- four at Hollow Brook, Chew Valley lake (5860) on 16 December, three at Avonmouth Sewage Treatment Works (5379) on 4 November, three at Weston Moor (4473) on 4 March, three at Heron's Green Pool, Chew Valley (5559) on 26 March, three at Sheep Wood(5778) on several occasions during the year, three on Denny Island Chew Valley Lake (5760) on 5 May and four at Tormarton (7778) on 20 February. Recorded by RB, JB, PC, C-web, PF, JMart, RM, EN, J&SP, JS, DT, DW.

Fallow Deer *Dama dama* No records for the year outside deer parks.

Chinese Muntjac Deer *Muntiacus reevesi*

Year	2000	01	02	03	04	05	2006
1-k Squares		0	1	1	3	2	1

An individual animal was seen running across the A431 at Willsbridge (6670) at 22.00hrs on 31 August. Record from NB/KN.

Sika Deer *Cervus nippon* numbers in the Poole Basin area of Dorset have increased to such an extent (current populations are estimated to be between 5,000 and 10,000) that the RSPB (Arne Reserve) and National Trust (Studland) have increased their annual culls to prevent increasing damage to saltmarshes, mires and heathland (BBC Wildlife 24 (2) Feb 2006).

EXOTICS/BEASTS/FORMER NATIVE SPECIES

Big cats

Reports of large beast/cats/panthers/leopards/pumas etc roaming the countryside attacking livestock continue to circulate in the press but as yet there have been no confirmed sightings. *'The proof is out there'* BBC Wildlife April 2006 24 (4). Data gathered by Danny Bamping of the British Big Cats Society between April 2004 and July 2005 suggested that there were 104 'big cat' sightings in Gloucestershire, 91 in Somerset and 64 in Wiltshire!

Wild boar *Sus scrofa*

A group of up to eight wild boar were living in the Westhay Heath area for a couple of weeks during the spring (JP pers comm). Where they came from and where they went is a mystery.

European Beaver *Castor fiber*

The beavers at Lower Mill Estate in the Cotswold Water Park continue to thrive. One of the males escaped during a very wet period and was last seen heading down the River Thames towards Oxford (CW pers comm).

ACKNOWLEDGEMENTS

My thanks to all those who provided records and information for this year's report:

J Aldridge (JA), R Andrews (RA), Richard Bland (RB), Jeffery Boswall (JB), Paul Bowerman (PB), P Bowyer (PBow), Bristol Avon Otter Survey (BAOS), Bristol Naturalists' Mammal Group (BNMG), Helen Brown (HB), Nigel Bull/Katharine Northam (NB/KN), John Burton (JB), Paul Chadwick (PC), Clevedon-web (C-web), P G Farmer (PF), P Hazelwood (PH), Joan Marsh (JMars), John Martin (JMart), Dan Merritt (DM), R G Mielcarek (RGM), Edward Niblett (EN), North Somerset Otter Group (NSOG), James Packer (JP), John and Sue Prince (J&S P), Jeff Rawlinson (JR), Lyndon Roberts (LR), Terry Smith (TeS), Tony Smith (TS), John Sparks (JS), Emma Stone (ES), David Trump (DT), Mary Trump (MT), David Warden (DW), Charlie Wilson (CW), M Woodman-Smith (MW-S).

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Corbet, G.B. and Harris, S. (eds). (1991) *The Handbook of British Mammals (3rd edition).* Blackwell Scientific Publications.

Trump, D.P.C. (2003) *The Barn Owl* Tyto alba*, field margins and small mammals. A study of barn owl corridors and the population dynamics and habitat use of small mammals at Clapton Moor Nature Reserve, North Somerset.* Unpublished MSc Thesis, Napier University, Edinburgh.

2007 Toad Report Norton's Wood Lane

Andrew Town

This report covers the 2007 Toad migration event. Every year the toads move from Norton's Wood on the south side of the lane to the Portbury Drain, which runs through the National Nature Reserve, to spawn. The distance is some 300 yards over grazing land, horse paddocks and some gardens.

The season began very early on Dec. 29th 2006. Movement was fairly steady, with a peak of 125 toads on Jan. 9th, until 19th by when 354 (58%) had moved. The next two weeks were cool, dry, and windy nights with no movement. Movement started again Feb. 1st and continued with mainly small numbers until it ended on March 4th. Return migration started on Feb 19th but only small numbers were recorded. By the end of March only 66 returns had been recorded compared with 199 in 2006 and 138 in 2005.

Only 607 were counted compared with 1066 in 2006 and 1014 in 2005. The patrol regime was the same as previous years and it is unlikely that large numbers were missed. It would appear that the reduction was real, and the population normally fluctuates. It was noticeable that there were no nights when large numbers moved. The greatest number for any night was 125 whereas in 2005 we had nights of 216 and 220, and in 2006 316, 192 and 240.

Another disappointing feature was an increase in the death rate to 15% from 12% in 2005 and 8% in 2006, though the actual numbers found dead were 90 in 2007, 87 in 2006 and 126 in 2005. It is always the case that nights with large movements have low death rates. The flap-down warning signs were used throughout the season but the 'road closed' signs were not used because in 2006 most drivers ignored the signs and many signs were stolen.

First toadspawn was recorded Feb. 19th, a month earlier than 2006, and two days earlier than in 2005. January average temperature was two degrees warmer in 2007 than 2006, suggesting that a one degree alteration in temperature creates a 13 day change in spawning date. Despite the drop in toad numbers there was plenty of spawning activity. At the latest visit May 15th there were good numbers of toadpoles all along the Portbury Drain.

Thanks once more to all the dedicated volunteers who contributed countless hours of their time.

Frogspawn 2004-2007

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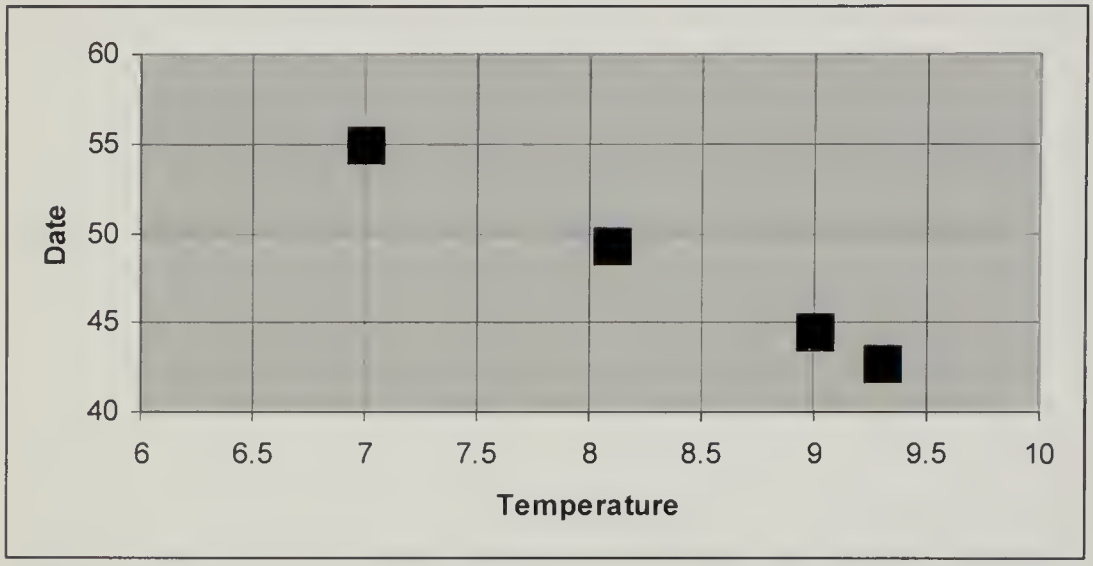
The national phenology website at www.phenology.org shows that Frogs start to spawn in the Scilly Isles in December, and the date of spawning spreads North and East across Britain. January temperature is likely to be relevant to the date of first spawning, though the data collected from the Bristol region since 2004 makes it clear that individual ponds in a particular area will have very different dates in the same year, probably because the water temperature is affected by many factors such as the water depth, pond aspect, shading, closeness to buildings etc. A rolling twenty year average of maximum January temperatures shows that they rose by 2C from 6.3C in 1900 to 8.2C in 1940, then fell to 6.9C in 1970, and then rose back to 8.0C today.

Thus our present experience is still within the range of normal variation. However if climate change begins to affect Bristol we are likely to see frogs spawning earlier, and it seems sensible to monitor the situation as effectively as we can. First frogspawn dates are an excellent and simple way of monitoring the impact of such change.

Since 2004 I have been collecting first dates from individual observers. Table 1 shows the number of observers, the number of observations from the previous year, the average date for all observations for each year, The average of repeat observations, the results for the six observers who have observed every year, and the average January temperature.

			Date	Date	Date	C
Year	Observers	Repeat	Average	repeat	Six gardens	Jan temp
2004	18	10	45.6	48.6	49.3	8.1
2005	23	10	42.4	44.1	44.5	9
2006	24	11	58.2	56.6	55	7
2007	40	16	47.1	42.5	42.8	9.3

The correlation between January temperature and the average of the six observers is remarkable, and shown in Graph 1. It suggests that a difference of one degree in the January temperature leads to a six day change in the spawning date. All three averages give very similar results



Graph 1. Relationship between mean maximum January temperature and average spawning date for six gardens who observed 2004 -2007

Since 1881 the January average has been 7.3C, but with very wide extremes between a maximum of 12.5C and a minimum of 0.1C. If the relationship with temperature were linear, which is unlikely, the earliest average date we could expect first frogspawn would be January 20th, and the latest April 1st. However Cornish records show that December spawning is possible. In 2007 the earliest record of spawn came on January 10th, following a December whose temperature was very close to the long-term average. Very early records are probably related to ponds that are sheltered and warm, and they run the risk of the spawn being frozen and killed by a subsequent cold snap. It may be that warmer winters are thus actually playing a part in reducing frog populations, as later spawning has a much greater chance of success.

Can I encourage everyone to let me know when frogs first spawn in their pond in 2008. The power of statistics is based on the sample size- the bigger the better.

Bristol & District Invertebrate Report, 2006

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INTRODUCTION

2006 may be remembered as a year when records were broken nationally for the length of the warm dry summer, with mild, if wet weather extending right into the winter months. It was a year when "Global Climate Change" became accepted in mainstream politics (even in the USA). The year may have begun with a mild start to January but there was a period of frosts and low daytime temperatures from late January right through to late March. After a brief flurry of spring in April, May was cool and wet. Then followed the long summer. It might be expected that this weather pattern would reflect itself in the appearance and abundance of invertebrate life. However, apart from the low temperatures suppressing much early activity in spring, the two most memorable aspects of 2006, in my experience were not related. They were the immigration of large numbers of moth species especially Humming-bird Hawk-moths and the abundance of Dark Green Fritillary butterflies on Mendip in mid-summer. Perhaps a close third would come the apparent (relative) explosion of Hornets across the region with individuals being seen in many new localities and nests also being spotted at new sites. As queen Hornets emerge late from hibernation (compared to other social wasps) they were not affected by the cool weather in May when other wasps may have faired perhaps not as well as normal.

The most surprising immigrant of the year was the appearance of an example of the Southern Emerald Damselfly which turned up at Keynsham in August. First recorded in Britain in 2002 in Norfolk subsequent individuals have been seen in succeeding years in Kent and the south and east of the country. However, to find one on this side of England was a surprise. Moth immigrants were led by the numbers of Humming-bird Hawk-moths followed by species such as the Scarce Bordered Straw and Striped Hawk-moth. Some of our usual immigrants did not show a comparable increase with very moderate numbers of Silver Y and a pretty poor year for the Rush Veneer. The Great Brocade which was found by Mike Bailey in his garden trap in Timsbury was an excellent find of another rare immigrant and once again showed the value of regular light trapping at one site and that unusual finds are always possible. Immigrant butterflies were not especially abundant but with respectable numbers of Clouded Yellow, Painted Lady and Red Admiral.

If the cool spring and long warm summer did not apparently directly affect many species, the continued accumulation of warmer years and particularly milder winters may be responsible for yet again new species spreading into the region from the south. The Long-winged Cone-head is now found throughout the region as is the Essex Skipper. This year their ranks were joined by the arrival of the Small Red-eyed Damselfly which was noted from two sites within a short space of time. This species only started to colonise this country in 1999. A new record of the shieldbug *Gonocerus acuteangulatus* suggests that this species is now likely to be well established, following its expansion into the region noted first in 2003.

Two new species of macro-moth were reported from the Bristol region for the first time, the Cypress Carpet and the Least Carpet. Both feed on coniferous species of tree and it is likely that they will increase. The arrival of the latter species has been expected for a couple of years now. Similarly it was only a matter of time before the leaf mines on Horse Chestnut of the micro-moth *Cameraria ohridella* appeared locally and also before the Harlequin Ladybird was discovered, considering how well established both have become in the south east of England.

Two other species of micro-moth were discovered during 2006 for the first time in the region, *Bedellia somnulentella* and *Grapholita lobarzewskii*.

The discovery of the picture-wing fly *Urophora quadrifasciata* and the click beetle *Selatosomus aeneus* reinforced the quality of the habitat at Ubley Warren on Mendip. A Chalk Carpet moth was also recorded here, a species of particular concern nationally.

At Leigh Woods, the sighting of the beefly *Villa cingulata* confirmed its continuing occurrence since its discovery at that site in 2004, a very rare species.

A Correction to the paper in the 2005 Proceedings "The arrival and spread of the Long-winged Cone-head *Conocephalus discolour* (Thunberg) in Somerset and the Bristol district, 1995-2005." by Robert Cropper. The last line of the last but one paragraph (page 109) should have read:
Whether this is due to competition with C. dorsalis, *which is widespread here, is not yet known but would seem unlikely.*
My sincere apologies for this transcription error which may have led to some confusion.

My thanks to all who have submitted records directly to the Society and particularly to Robert Cropper, the Bristol Regional Environmental Records Centre (BRERC) and to the Bristol Wildlife e-group. The importance of receiving, not just the records picked out here, but those of perhaps less noteworthy species cannot be understated in terms of monitoring the ever changing status of the invertebrate fauna.

Scientific nomenclature follows that given in Bradley (2000), Brooks (1997), Chandler (1998), Duff (1993), Fitton *et al* (1978) and Potts (1964).

Species of note in 2006

INSECTA

Odonata (damselflies and dragonflies)

Lesser Emperor Dragonfly Blagdon Lake, North Somerset ST5059 (vc 6) July 2006 Bristol Wildlife e-group; Chew Valley Lake, Bath & North East Somerset ST5658 (vc 6) 2006) Bristol Wildlife e-group; Severn Beach, South Gloucestershire ST5483 (vc 34) August 2006 Bristol Wildlife e-group.
Small Red-eyed Damselfly Severn Beach, South Gloucestershire ST5483 (vc 34) 2006 Bristol Wildlife e-group; Bath University Campus, Bath & North East Somerset ST7764 (vc 6) August 2006 Bristol Wildlife e-group.
Southern Emerald Damselfly *Lestes barbarus* Keynsham, North Somerset ST66 (vc 6) 26 August 2006 one photographed, Mike Dimery.

Orthoptera (grasshoppers and crickets)

Long-winged Cone-head *Conocephalus discolour* (Thunb.) Burnham-on-Sea, Somerset ST301503 (vc6) 20 July 2006, Clapton Moor, AWT NR North Somerset ST459737 (vc6) 22 July 2006 swept, Ray Barnett; Robert Cropper; Tealham Moor, Somerset ST410457 (vc6) 05 August 2006 Robert Cropper; Huntspill seawall, West Huntspill, Somerset ST2945 & ST2946 (vc6) 12 August 2006 Robert Cropper; Brent Knoll, Somerset ST3450 (vc6) 19 August 2006 Robert Cropper; Gordano Valley, North Somerset ST4473 (vc6) 20 August 2006 Robert Cropper; Brean Down, Somerset ST291589 (vc6) 24 September 2006 Robert Cropper.
Rufous Grasshoppper *Gomphocerippus rufus* (L.) Puriton, Somerset ST317413 (vc6) 05 August 2006 a few stridulating on roadside, Robert Cropper; Weston Moor AWT NR ST441742 (vc6) 10 September 2006 several swept, Ray Barnett.

Lesser Marsh Grasshopper *Chorthippus albomarginatus* (DeG.) Weston Moor AWT NR ST444735 (vc6) 10 September 2006 swept, Ray Barnett.
Stripe-winged Grasshopper *Stenobothrus lineatus* (Panz.) Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 swept, Ray Barnett.

Dermaptera (earwigs)

Lesne's Earwig *Forficula lesnei* (Finot) near River Frome, Farleigh, Hungerford, Somerset ST804577 (vc6) 06 August 2006 good numbers in roadside hedge (new 10km record), Robert Cropper.

Hemiptera (true bugs)

Tortoise Bug *Eurygaster testudinaria* (Geoff.) Leigh Woods, Bristol – The Plain ST556732 (vc6) 25 June 2006 and 28 June 2006 sweeping, Ray Barnett; Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 swept, Ray Barnett.
Sciocoris cursitans (Fabr.) Berrow, Somerset (vc6) 08 July 2006 several adults and larvae on stabilising dunes just behind the shore, Robert Cropper; Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 one larva swept, Ray Barnett.
Neottiglossa pusilla (Gmelin) Walton Common, North Somerset ST425736 (vc6) 02 June 2006 one swept, Ray Barnett.
Gonocerus acuteangulatus (Goeze) 85 Cornwall Road, Bishopston, Bristol ST585757 (vc34) 28 May 2006, one found in a window box, Ray Barnett.
Corizus hyocyami (L.) Henleaze, Bristol ST5876 (vc 34) January 2006 one found and photographed in garden, Mrs Sylvia Kelly; Burnham-on-Sea, Somerset ST3149 (vc6) 11 September 2006 one on lilies, Robert Cropper.
Piloporus perplexus Doug. & Scott Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 one swept from low tree foliage, Ray Barnett.
Pseudoloxops coccineus (Mey.-Dur) Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 Mrs Janet Boyd.
Ranatra linearis (L.) Clapton Moor, AWT NR North Somerset ST459737 (vc6) 22 July 2006 one larva in pond net, Ray Barnett.
Issus coleoptratus (Fabr.) Bristol Downs ST565744 (vc34) 08 July 2006 swept, Ray Barnett; Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 swept, Ray Barnett; Weston Moor AWT NR ST444735 (vc6) 10 September 2006 swept, Ray Barnett.

Lepidoptera (butterflies)

Essex Skipper *Thymelicus lineola* (Ochs.) Bristol Downs ST565744 (vc34) 08 July 2006 Ray Barnett.
Small Blue *Cupido minimus* (Fuess.) Dolebury Warren, North Somerset ST4558 (vc6) 17 June 2006 one on the lower slopes, Robert Cropper.
Dark Green Fritillary *Argynnis aglaja* (L.) Ubley Warren Somerset ST505555 (vc6) 16 July 2006 Ray Barnett; Velvet Bottom Somerset ST505557 (vc6) 16 July 2006 Ray Barnett.
Wall *Lasiommata megera* (L.) Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 Ray Barnett.

Lepidoptera (micro-moths)

Ochsenheimeria taurella (D. & S.) Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 Ray Barnett.
Bedellia somnulentella (Zell.) Chew Valley Lake, Bath & NE Somerset ST55 (vc 6) August 2006 Rich Andrews.
Cameraria ohridella Des. & Dim. Royate Hill, Bristol ST6174 (vc 34) 23 August 2006 (leaf mines) Rich Andrews.
Grapholita lobarzewskii Rag. Timsbury, Bath & NE Somerset ST659587 (vc 6) 15 June 2006 Mike Bailey; Whitchurch, Bristol ST66 (vc 6) 04 July 2006 Rich Andrews.

Lepidoptera (macro-moths)

Cistus Forester *Adscita geryon* (Hb.) Walton Common, North Somerset ST425736 (vc6) 02 June 2006 several flying Ray Barnett; Dolebury Warren, North Somerset ST44 58 and ST4558 (vc6) 17 June 2006 several flying, Robert Cropper.
Silky Wave *Idaea dilutaria* (Hb.) The Gully, The Downs, Bristol ST563745 (vc 34) 09 July 2006 Ray Barnett.
Least Carpet *Idaea rusticata* (D. & S.) Whitchurch, Bristol ST6 6 (vc 6) 22 July 2006 Rich Andrews; Bishopston, Bristol ST5875 (vc 34) 23 July 2006 Rupert Higgins.
Cypress Carpet *Thera cupressata* (Gey.) Weston-super-Mare, North Somerset ST36 (vc 6) 18 June 2006 and 01 July 2006 Paul Bowyer.
Chalk Carpet *Scotopteryx bipunctaria* (D. & S.) Ubley Warren Somerset ST505555 (vc6) 16 July 2006 Ray Barnett.
Convolvulus Hawk-moth *Agrius convolvuli* (L.) Dundry, Bristol ST56 (vc 6) 11 October 2006 Dave Nevitt.

Hummingbird Hawk-moth *Macroglossum stellatarum* (L.) Jacob's Wells Road, Clifton, Bristol ST5772 (vc 34) 03 April 2006 Tim McGrath; Long Ashton, North Somerset ST57 (vc 6) 05 November 2006 Michael Pocock. (Early and late dates.)
Striped Hawk-moth *Hyles livornica* (Esp.) Leigh Woods, Bristol ST5673 (vc6) 25 May 2006 Steve Ogden.
Four-spotted Footman *Lithosia quadra* (L.) Burnett, Bath & NE Somerset ST6665 (vc 6) 20 September 2006 Richard Pooley.
Great Brocade *Eurois occulta* (L.) Timsbury, Bath & NE Somerset ST659587 (vc 6) 06 August 2006 Mike Bailey.
Cosmopolitan *Mythimna loreyi* (Dup.) Timsbury, Bath & NE Somerset ST659587 (vc 6) 13 September 2006 Mike Bailey.
Scarce Bordered Straw *Helicoverpa armigera* (Hb.) Clevedon, North Somerset ST47 (vc 6) 22 September 2006 James Payne.
Bordered Straw *Heliothis peltigera* (D. & S.) Burnett, Bath & NE Somerset ST6665 (vc 6) 05 June 2006 Richard Pooley.
Ni Moth *Trichoplusia ni* (Hb.) Clevedon, North Somerset ST47 (vc 6) 22 September 2006 James Payne.
Buttoned Snout *Hypena rostralis* (L.) Newton St Loe, Bath & NE Somerset ST7165 (vc 6) 12 October 2006 one, Darrell Watts.

Coleoptera (beetles)

Green Tiger Beetle *Cicindela campestris* L. University Road, Clifton, Bristol ST580732 (vc34) 09 May 2006 one active on pavement, Ray Barnett.
Aphodius rufus (Moll) Moorlinch, Somerset ST3936 (vc6) 12 August 2006 two at moth-trap, Robert Cropper.
Onthophagus joannae Goljan Walton Common, North Somerset ST425736 (vc6) 02 June 2006 one swept, Ray Barnett.
Omalopia ruricola (Fabr.) Dolebury Warren NR, North Somerset ST4458 (vc6) 17 June 2006 one flying in midday sunshine, Robert Cropper; Leigh Woods, Bristol – The Plain ST556732 two or three swept, (vc6) 25 June 2006 and 28 June 2006, Ray Barnett.
Cantharis fusca L. Shapwick Heath, Somerset ST416 404 (vc6) 29 May 2006 one in flight, Robert Cropper.
Selatosomus aeneus (L.) Ubley Warren Somerset ST505555 (vc6) 16 July 2006 one swept, Ray Barnett.

Harlequin Ladybird *Harmonia axyridis* (Pallas) Weston Moor AWT NR ST444735 (vc6) 10 September 2006 (1st Somerset record) one found on path, John Mortin; Clevedon, North Somerset ST47 (vc 6) 29 September 2006 James Payne; Yatton, North Somerset ST46 (vc 6) 01 October 22006 Tony Moulin; Redcliffe Street, Bristol ST591729 (vc 6) 18 October 2006 James Barnett.

Sulphur Beetle *Cteniopus sulphureus* (L.) Bristol Downs ST565744 (vc34) 08 July 2006 several, Ray Barnett; The Gully, The Downs, Bristol ST563745 (vc 34) 09 July 2006 several, Ray Barnett.

Melandrya caraboides (L.) Berrow dunes, Somerset ST2951 (vc6) 27 May 2006, one under log on foreshore, Robert Cropper.

Phymatodes alni (L.) Walton Common, North Somerset ST425736 (vc6) 02 June 2006 2nd Somerset record, (1st Ashton Court 2001 – David Boyce) one swept, Ray Barnett.

Sermylassa halensis (L.) Dolebury Warren NR, North Somerset ST448588 (vc6) 12 August 2006 one swept, Ray Barnett.

Kalcapion semivittatum (Gyll.) Bedminster, Bristol ST585711 (vc34) 21 December 2006 Andrew Duff. 2nd record for vc 34 (1st from Redfield, Bristol in 2001 – David Gibbs). Also, only known from one record in vc 6, but finder suspects may be widespread in Bristol on waste ground.

Hymenoptera (bees, wasps and ants)

Hornet *Vespa crabro* L. Leigh Woods, NT, Bristol ST559736 (vc6) 25 June 2006 queen scraping nest material from dead tree, Ray Barnett; Shapwick Heath, Somerset ST4241 (vc6) 29 July 2006, worker on Hemp Agrimony, Robert Cropper; Woodland Road, Clifton, Bristol ST581737 (vc34) 12 September 2006 one worker in flight, Ray Barnett; Weston Big Wood, North Somerset ST47 (vc6) 2006 nest photographed by Tim McGrath; Newton St Loe, Bath ST7165 (vc6) 2006 one worker Darrell Watts.

Andrena cineraria (L.) Brandon Hill, Clifton, Bristol ST579727 (vc34) 07 June 2006 many at flowers, Ray Barnett.

Megachile leachella Curt. Berrow, Somerset ST2951 (vc6) 08 July 2006 several colonies along stabilising dunes behind beach, Robert Cropper.

Nomada leucophthalma (Kirby) Burnham-on-Sea, Somerset ST31 49 (vc6) 03 & 04 May 2006 good numbers of males flying around beech tree of this local coastal species, Robert Cropper.

Bombus muscorum (L.) Berrow, Somerset ST2951 (vc6) 08 July 206 queen at *Lathyrus sylvestris* at edge of dune marsh, Robert Cropper; Huntspill River (north bank), West Huntspill, Somerset ST294457 (vc6) 17 July 2006 two workers at *Trifolium pratense*, Robert Cropper.

Diptera (true flies)

Tropidia scita (Harris) Lawrence Weston Moor LNR, Bristol ST543791 (vc34) 21 June 2006 one found at rest, Ray Barnett.
Volucella inanis (L.) Burnham-on-Sea, Somerset ST3149 (vc6) 22 August 2006 female at mint in garden, Robert Cropper.
Chrysopilus asiliformis (Prey.) Clapton Moor, AWT NR North Somerset ST459737 (vc6) 22 July 2006 one swept, Ray Barnett.
Bombylius canescens (Mik.) Dolebury Warren, North Somerset ST45 58 (vc6) a few flying in grassland, Robert Cropper.
Bombylius discolor Mik. Siston Common, Bristol ST67 (vc 34) 21 April 2006 Nick Hudson; Newton St Loe, Bath ST7165 (vc 6) April 2006 Darrell Watts.
Villa cingulata (Meig.) Leigh Woods, Bristol – The Plain ST556732 (vc6) 25 June 2006 two seen, Ray Barnett.
Urophora quadrifasciata (Meig.) Ubley Warren Somerset ST505555 (vc6) 16 July 2006 adult swept, Ray Barnett.

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A photographic guide to the Grasshoppers and Crickets of Britain and Ireland

by Martin Evans and Roger Edmondson.
A review by Robert. S. Cropper.
14 Rosewood Close Burnham-on-Sea TA8 1HG

Despite being a fascinating group of insects, most of which are not too difficult to identify, the grasshoppers and crickets (Orthoptera) seem to have acquired surprisingly few enthusiasts compared with butterflies and moths (Lepidoptera) and dragonflies (Odonata). Could it be that the problem lies with the lack of a suitable Field Guide on the subject? If this is the case, the gap has now been filled by the publication of this well-illustrated and informative little book.

This is the most comprehensive work on British and Irish Orthoptera to date, covering not only every resident native species but also new colonisers such as the Large Conehead *Ruspelia nitidula* and Sickle-bearing Bush-cricket *Phaneroptera falcata*, and, uniquely among works on this subject, several introduced species likely to have originated from the local pet shop!

Many of our species are very variable, and this has been taken into account. Both the nymphs and most of the colour-forms are illustrated. The life-size illustrations of each species inside the front cover will also be very useful, and it should be very simple to make a direct comparison with any tubed specimen. A series of picture keys should ensure that correct identification can be reached without too much trouble.

It is to be hoped that this informative guide will find its way into many rucksacks, though it cannot really be described as a pocket book unless you have very large pockets! I thoroughly recommend this new guide; not only is it very informative, but the binding is sturdy, and it should withstand the pressures of fieldwork well. All those birdwatchers who have already expanded their interests to include butterflies and dragonflies can now also add these fascinating and charming little creatures to their lists and I for one sincerely hope that they will.

A photographic guide to the Grasshoppers and Crickets of Britain and Ireland, by Bristol residents Martin Evans and Roger Edmondson, is published by WGUK (2007) 183pp ISBN 978-0-9549506-1-3. It may be ordered, price £21.95, via the website at www.wildguideUK.com or by cheque by contacting Martin Evans at martinevans@wildguideuk.com

A snail's migraine.

Tony Smith 30 Timberdene Stapleton BS16 1TJ

Leucochloridium paradoxum, a lucky find for me.

As I was surveying a ditch at Sharpham, near Glastonbury on the Somerset levels, I saw a couple of Pfeiffer's Amber Snails in my sample that were both being eaten alive from the inside by a grub that had entered through the mouth. I watched fascinated as the grub was churning around. It seemed to have reddish-brown spiral markings and was spinning in the snail.

But I was wrong. The truth was far worse. I was looking at the snail's tentacle that was grossly enlarged. This was a stage in the life-cycle of a trematode parasite (liver fluke) *Leucochloridium paradoxum,* that had grown from an ingested egg. The egg develops in stages and eventually becomes a sac-like sporocyst that migrates from the snail's digestive system (hepatopancreas) into one of its tentacles. With the hand lens I could see the pulsing of the parasite. More than once every second it thrust up and beat against the eye at the tip of the tentacle and so the external appearance is rather like that of a wriggling, twisting worm, presumably causing great pain to its host. The parasite is making part of the snail look like a tasty dinner, if you're a bird.

I took one of the affected amber snails home to study more carefully and found that the rapid pulsing and stretching activity in the tentacle continued virtually non-stop for at least five days. To enhance the effect the normally photophobic semi-aquatic snail changes behaviour and climbs out of the water on to exposed reeds or even climbs to exposed positions on adjacent trees. On my kitchen windowsill it climbed out of the ditchwater in its tray, climbed on to the window and on to a pot plant. It crept over the tiling round the kitchen sink and all the while the parasite was pulsing away. My wife occasionally objected to the snail walking round the kitchen and pleaded with me to put it out of its misery. Five days later, before I went away for a couple of days I put the snail, parasite and tray behind the dustbin and the snail was gone by the time I came back.

Crows and jays, sparrows and finches eat these snails, or only their highly coloured infected tentacles. The parasite continues its development inside the bird's gut, ending up in the rectum feeding harmlessly on waste that is about to be voided and produces eggs parthenogenetically. As the amber snail feeds on bird droppings in the water it ingests the eggs of the parasite and only then does the parasite's life-cycle go to completion.

The Botanical importance of the Tyntesfield Estate.

Pam Millman
19 Jubilee Drive, Failand BS8 3XD

During the time local botanists were working on The Flora of the Bristol Region access to the estate was not allowed. Sadly Lord Wraxall did not appreciate the importance of completing this survey; hence all Atlas records show a gap for the kilometer square ST5071. The estate also covered a significant portions of three adjacent squares.

Since 2002 when the National Trust purchased one quarter of Tyntesfield Estate (about 220 hectares) I have visited it recording the flora both for the NT and for our own records. Members of the Botany section of BNS have often joined me. There is a good range of habitats to visit.

A narrow strip of woodland, Truckle Wood, ST500715, running north to south on the western side of Home Farm was designated as Ancient Woodland by Arthur Rackham the national woodland specialist. Green Hellebore,*Helleborus viridis* occurs here near a field edge. This is a RDB plant and there are two other sites for it not far away.

Part of Wraxall Hill Wood, ST497717, is also an ancient woodland, with more recent areas dominated by beech and yew.

A larger, mainly deciduous, woodland, Tyntesfield Plantation, ST510715, lies to the north of the house, again on a south facing slope. William Gibbs in the 1860's probably added to this area with planted trees. This wood has many mosses and fungi. A large area of wild Rhododendrons has established itself, and parts are dominated by Laurel.

Passing into the next recording square, ST4971, to the west of Truckle Wood, there are two large fields on a south facing slope. The furthest of these, Battleaxes Field (named after the local pub and the family crest) has a fair amount of exposed limestone and here there is unimproved limestone grassland. Fortunately this area is steep enough not to be grazed and we found a good range of indicator herbaceous species including Pale St John's-wort, a locally scarce plant.

An interesting old feature, the Watercatch, at ST509719, has given rise to another different habitat. It is an acre of concreted ground which collected rainwater, which was piped to the house supplying most of their non-drinking water. This has gradually disintegrated presumably producing

more alkaline soil in the cracks. Four species of Geranium, both Wild and Sterile Strawberry, much Marjoram and a clump of Field Pepperwort are amongst the plants here, many very small as the site soon dries out.

Returning to the area near the house there is a good limestone grassland bank above the tennis court at ST504716 where Bee and Green-winged Orchids are found, whilst the formal lawns around the house itself, ST506515, give a wonderful display of Autumn Ladies Tresses in late August. I have counted over 500 in both 2005 and 2006. Possibly the turf was brought from the Downs where the plant was not uncommon in the mid-19th century. Many of the formal lawns are also very good for fungi in particular wax caps. The estate is one of the best National Trust sites for fungi.

During the 1860s many unusual trees were planted by William Gibbs, often shipped across the Atlantic. These were used to landscape the grounds and create an arboretum called Paradise, at ST503716, an extension of the garden. They have had an influence on the previously open grassland by added shade and accumulation of fallen leaves. Twenty Twayblades were seen recently in this area. The trees include several national champions.

The Wildlife of the New Cut

R.L.Bland from information provided by John Purkiss, Secretary, Friends of the Avon New Cut Tel: 0117 9665462 E-mail: johnpurkiss@talk21.com

The New Cut, three kilometres long, was built between 1803 and 1809, a vital part of the complex project to create the world's largest tide-free dock area, known as the Floating Harbour (because the ships in it could float at all states of the tide) or City Docks. Essentially the scheme dammed the river Avon in two places, at the site now known as the Underfall Yard by the Cumberland Basin, and up stream at Netham. To maintain a constant level of thirty three feet above low tide, water was fed into the dock system by a canal from Netham to Temple Meads, and the weir at Netham ensured that the water lost at Cumberland Basin when ships locked in or out to go down stream to sea was automatically replaced. The New Cut was built to ensure that flood water coming down the Avon would not flood into the docks, and it also enabled small vessels to lock into the navigable Avon either at Bathurst basin or at Temple Meads. The Avon had been made navigable to Bath by locks in the 18th century, and shortly after the construction of the Floating Harbour the navigation was extended to London by the Kennet and Avon canal. This created the 19C equivalent of the M4, and it cut the freight distance to London in half, as previously all freight traffic on the Severn that wanted to get to London had to go round Cornwall, and also round Kent, a journey of well over 200 miles, subject to all the risks of storms at sea and dangerous currents. The canal reduced the journey to 120 miles of calm horse-drawn travel. It is worth recalling too that the barges that worked the canals carried 70 tons, twice the load of the largest juggernaut on the motorways today.

Thus the New Cut had to be tidal, to enable vessels coming up the Avon on the tide to lock into the tide free system. Today, cutting right through the heart of the city from Cumberland Basin to Temple Meads, the New Cut has twelve metres of tidal water racing up and down it twice a day, creating a very remarkable wildlife corridor, and a vivid reminder of Bristol's past. A brief calculation suggests that every day around one million cubic metres of water move through the Cut. One important consequence is that, while the Floating Harbour is fresh water, the water in the New Cut is saline, and the vegetation along its banks has some plants characteristic of saltmarsh. The existence of the New Cut has ensured that even the worst floods on the River Avon pose no threat to the city centre, despite the fact that it is virtually at sea level, though the River Frome floodwater has had to be diverted under the Downs in modern times. The salinity of the water in the Cut varies with the tides and the quantity of land water coming down the

Avon, and normally the water is the same muddy brown as the estuary itself, though just occasionally the water mysteriously runs clear. The salinity levels are also affected by the fact that fresh water floats over salt water, and that as the tide rises the fresh water is being pushed backwards. The Cut is thus a genuinely wild, untamed, habitat, not neat, not pretty, a sharp and brilliant contrast to the human technology of the city.

The banks of the Cut have become clothed in a remarkable assemblage of trees and plants. In some places the bank is a vertical masonry or concrete wall, in others a near vertical rock face, and in others a sloping bank, sometimes down to a wall. Only a few species can withstand being submerged by saline water, and below that level there is tidal mud. Trees dominate much of the sloping bank, especially on the south side, and form a green corridor through the heart of the city. Some have been planted on the pavements along the edge, mostly London Plane, but also Norway Maple, and some Common Lime on a section of the North side. The City Council has planted some interesting trees on the Redcliffe Roundabout, including Black Pine and Bhutan Pine, Sweet Gum and Tulip Tree, some unhappy looking Silver Birch and a Weeping Willow. Other species planted along the bank include Grey Alder and Grey Poplar, one Pissard's Plum, and several garden forms of *Prunus* on the south bank, and there is an extraordinary very young White Mulberry. Most of the trees on the slopes are wholly self sown, and mostly quite young, few being over fifty years old, though there are trees at the seaward end on the south side that started life a century or more ago. The most frequent species are Sycamore and Ash, with an understorey of Elder and Hawthorn, and occasional wild and garden Privet, Snowberry, Japanese Spindle and Hazel, with Buddleia and Bramble sprawling everywhere. There are a large number of Wildling Apples, from apple cores, some delicious, and very many Cherries, some producing luscious looking fruit. There are several Rowan, a Whitebeam and a Swedish Whitebeam. The most unusual trees are the two huge Figs, each of which sprawl along about 20 metres of bank on the South side. There is quite a lot of regeneration, with young apples, suckering English Elm in one place, suckering White Poplar in another, Norway Maple, Ash, one or two baby Horse Chestnuts, a couple of young Oaks, and Sallows and four young Almonds. All in all there are 43 species of trees and shrubs, a very remarkable collection whose nectar and fruit support a very wide variety of insect and bird life.

Below the point that the highest tides reach there are nine saltmarsh species. Saltmarsh is the wildest habitat in Britain, the least influenced by man, and there are around twenty common species that make up the flora of the

Plate 1 A Woodmouse. P33 (D Trump)

Plate 2 In Berkeley Park. P41 (D Trump)

Plate 3 Himalayan Balsam, *Impatiens glandulifera* P 74 (T Smith)

Plate 5 Beef steak fungus (*Fistuline hepatica*) P 74 (T Smith)

Plate 4 King Alfred's Cake fungus (Daldinia concentrica) cut to show the concentric rings. P 74 (T Smith)

Plate 6 Carving in the tree trunk adjacent to the seat on the lower path, P74 (T Smith)

Plate 7 Bubbles of gas arising in the pond in the south west corner P76 (T Smith)

Plate 8 English Bluebells (*Hyacinthoides non-scripta)* P77 (T Smith)

Plate 9 Plane tree in Whiteladies road, c 1880 p 82 (RL Bland)

Plate 10 Sycamore on Bridge Valley Road, c 1800 P86 (RLBland)

Plate 11 Hoverfly (R Muston)

Plate 12 Bracket fungus. (R Muston)

Plate 13. A huge veteran Small-leafed Lime, Abbotts Leigh (RL Bland)

Plate 14. Pale Flax on Zoo bank, Clifton (RL Bland)

Plate 15 March 15 2007 The Avon runs clear. Why ? (RLBland)

Plate 16 Mistletoe triumphant, Long Ashton (RL Bland)

Severn saltmarsh. The first species to rise from the mud of the New Cut is Sea Aster. This flowers in late June, though often it has no petals. A little higher is usually Sea Couch Grass, and often mixed in with it Clustered Dock and the grey leaves of Spear-leaved Orache. Cord Grass comes next, though out on the Severn it is usually the first to bind the mud. It is often mixed with English Scurvy Grass, a plant with thick green leaves and white flowers in early May. (It is a close relative of Danish Scurvy Grass which can be found in April lining all our motorways, and many major roads, occupying the thin strip that has absorbed the salt from winter de-icing.) Just higher than that, and clinging to a few vertical surfaces there is Sea Plantain and Greater Sea Spurrey. Both these are normally part of the broad section of saltmarsh that is inundated only half a dozen times a year. Finally at the top of the tidal range there is Wild Celery, a bright green umbellifer with small white flowers in late June. Above it Hemlock Water Dropwort, essentially a plant of freshwater, steadily increases in numbers upstream, emphasising the fact that the water of the highest tides is actually fresh water riding over the saline water below. It is interesting that there is no Indian Balsam, which cannot abide any salt at all.

Above the tide, beneath the trees, and on more open sections, especially on the north side, there are at least 123 species of self-sown native wild plants, and ten species of garden plants that have either been thrown out or planted. The *Flora of the Bristol Region* mapped all plant species by 1km square, and the percentage occurrence is a good guide to how rare or common each species is. There are 31 species that are "Very Common" in the region, present in 80% or more of squares; 35 Species are "Common", present in between 60 and 80% of squares; 46 species are "Not Uncommon", between 40 and 60%; 89 species are "Uncommon", between 20 and 40% and all other species are "Rare". The best way to assess the significance of the New Cut plant species (other than trees and shrubs, and the saltmarsh species) is to look at their frequency structure. The table gives the basic structure.

	Species	Percent
Very Common	26	22
Common	18	15
Not uncommon	21	18
Uncommon	20	17
Rare	35	29

Table. 1 The number and proportion of 120 native self-sown species on the cut that fall into the five frequency classes.

As might be expected the Very Common species include 83% of all the local species that fall into this category, and the Common species are half of all the regionally common species. 45% of the Not Uncommon species are also present. There is a full list in the appendix, which also shows their regional percentage frequency. Some of the plants that fall into the Uncommon and Rare categories are worth a mention. Surprisingly Bluebells can be found, though they may well be the Spanish species and a result of garden throw-outs. There is only one example of Japanese Knotweed, a spreading alien species that is common both upstream and in some places downstream of the New Cut, but which fortunately has not colonised the Cut. Canadian Fleabane is widespread on the north side, and is a common urban species, but much less common outside Bristol. Alexanders is a plant that seems to like being close to the sea, as it is rarely found far from it. It is less frequent along the Cut than might be expected. Ivy Broomrape is common, especially on the north side because Ivy is common there. Chicory is an attractive blue flower, which flourishes in poor soil and waste spaces, but is rare in the region, and only found by the Create Centre. Giant Hogweed is a magnificent but rare alien whose seeds float down rivers, and there are two fine plants on the south side. Touching it can cause photosensitization reaction for some people, so there is a campaign to eradicate it. Mexican Daisy is a very attractive alien, common in Bristol walls. Hop is occasional in the region, and can be found on both sides. Dusky Cranesbill and Monkshood are both likely to be garden throw outs; or perhaps intentionally planted.

A wide variety of native plants will attract a wide variety of insects. 20 butterfly species have been seen at "Butterfly Junction" near the Create Centre, attracted by the excellent mix of shrubs and native species in the grass. Nettles and brambles, which abound along much of the Cut, are the food species for the larvae of several moths and butterflies, and the nectar provided by the very wide range of flowers over most of the year will provide food for many insect species.

A range of insects, berries, and water-borne food will attract many birds. Some 36 species have been recorded since 2003. The mudbanks seem to have little food, and only two wader species have been seen. The Redshank occasionally come this far up the river in cold conditions, and Common Sandpiper use the Cut as a migratory corridor in spring. The commonest water birds are the gulls, Black-headed in winter, and Herring and Lesser Black-backed both winter and summer. Much of the time they seem to use the water for bathing, or simply loafing. Some of them carry large coloured Darvic rings with letters and numbers. They have been ringed over the past thirty years by Peter Rock, who has a detailed history of hundreds of his

birds. As they can live for forty years or more every record is of interest and the details of the ring and colour should be sent to him at pete.rock@blueyonder.co.uk. It is amazing to think that the first pair bred in Bristol in 1970, and that the population of 2500 pairs is increasing at a constant rate of 10% a year. The only effective way to check that growth would be to end all take-away food outlets, and insist that all waste food was put into secure containers. The city has begun an attempt to control breeding by putting ceramic eggs in nests, but the cost is high.

A few pairs of Mallard can always be found, and seem to find enough to eat. Moorhen have been seen, which is surprising for a species normally only associated with fresh water. Herons can be seen fairly regularly, and presumably find some fish and Cormorants are sometimes seen on the trees, and have been seen to catch eels despite the opaque waters of the Cut. The Kingfisher is also occasionally seen in winter. A pair or two of Grey Wagtails breed, using niches in masonry as nest sites.

About twelve other species use the shrubs and trees on the south side for nesting. Wren, Dunnock and Robin are frequent, as are Blackbird. Greenfinch, Chaffinch and probably Goldfinch all nest, as do Magpie. Feral Pigeon nest under the bridges, Wood Pigeon Collared Dove and Carrion Crows in the trees. Both Chiffchaff and Blackcap have been heard, and may well breed. Jackdaw nest in the chimneys of neighbouring houses, and House Martins have set up at Pooles Wharf. Kestrels nest on the Create Centre. Other species occasionally seen include Goldcrest and Jay. House Sparrows, and Starlings, once abundant, are now very scarce. The cause of their abrupt decline is uncertain, but they face increasing competition for available food from the ever-increasing gull population.

City centres are not often associated with abundant wildlife, and Bristol is exceptionally fortunate to have retained so much for so long. Wildlife is always under threat from those who believe they can find a "better" use for any green space, and who arrogantly regard land not used for human profit as "waste". The New Cut may be an artificial creation to meet needs that in part have vanished, but it has become a vital resource for both those who live around it, and all Bristol citizens. It needs friends to make sure that it is left alone, and luckily it has them. The information upon which this article is based comes partly from personal observation, and partly from the work of the Friends of the New Cut (FRANC) and further information about their work can be found at www.southvillecentre.org.uk

Appendix. Species lists.

Table 1 New Cut List of Trees (T) and Shrubs (S). P indicates Planted The column headed N indicates the north side of the cut, S the south side.

Species		N	S			Species		N	S	
Almond	T	x	x			Rowan	T	x	x	
Apple	T	x	x			Sallow	T	x		
Ash	T	x	x			Silver Birch	T	x	x	P
BhutanPine	T		x	P		Swedish Whitebeam	T		x	
Black Pine	T	x		P		Sweet Gum	T	x		P
Cherry	T	x	x			Sycamore	T	x	x	
Cherry plum	T		x			Tulip Tree	T		x	P
Common Alder	T	x				Weeping Willow	T	x		P
Common Lime	T	x	x	P		White Mulberry	T		x	P
Common Oak	T	x	x			White Poplar	T	x		P
Domestic Plum	T	x	x			Whitebeam	T		x	
English Elm	T		x			Elder	S	x	x	
Field Maple	T	x				Firethorn	S	x		
Fig	T		x			Garden Privet	S		x	P
Grey Alder	T	x		P		Hawthorn	S	x	x	
Grey Poplar	T	x		P		Hazel	S		x	
Horse Chestnut	T	x	x			Japanese Spindle	S	x	x	P
London Plane	T	x	x	P		*Lonicera Fragrantissima*	S		x	P
Norway Maple	T	x	x	P		Red Currant	S	x		
Pissards Plum	T		x	P		Snowberry	S		x	
Prunus sp	T	x	x	P		Wild Privet	S	x		

Table 2 Plants of the New Cut. S indicates a saltmarsh plant, G a garden plant. The last column gives the percentage frequency of the species by one-km square in the Avon region, an indication of its rarity.

Species	N	S	%		Species	N	S	%
Alexanders	x	x	5		Hop Trefoil	x		20
Alkanet	x	x	12		Ivy	x	x	96
Annual Mercury	x		34		Ivy broomrape	x	x	4
Beaked Hawksbeard	x		46		Ivy-leaved Toadflax	x	x	53
Biting Stonecrop	x		29		Japanese Knotweed			19
Bittersweet	x		81		large Bindweed		x	22
Black Medick	x		78		Lesser Hop Trefoil	x		52
Black Mustard	x		13		Lesser Meadow Rue		x	2
Blackberry	x	x	95		Male Fern		x	63
Bluebell	x	x	69		Meadow buttercup	x	x	84
Bristly Oxtongue		x	32		Meadow Vetchling		x	76
Briza maxima (G)		x	0		Mexican Daisy	x		1
Broad-leaf Pea	x		4		Michaelmas Daisy	x		na
Broad-leaved Willowherb	x	x	42		Monkshood (G)		x	na
Buddleia	x	x	28		Montbretia (G)	x	x	2
Burdock	x	x	49		Mugwort	x	x	46
Canadian Fleabane	x	x	9		Nettle	x	x	97
Canadian Golden Rod	x	x	6		Nipplewort	x	x	78
Carrot	x		43		Old Mans beard	x	x	65
Catsear	x		62		Opium Poppy		x	9
Celandine	x	x	80		Oxeye Daisy	x	x	70
Chicory	x		4		Oxford Ragwort	x	x	27
Cleavers	x	x	96		Pellitory	x	x	13
Clustered Dock (S)	x	x	35		Pendulous Sedge	x		29
Common Mallow	x	x	48		Perforate St Johns Wort	x	x	41
Common Poppy		x	37		Periwinkle (G)	x	x	na
Common Vetch	x		64		Pink Oxalis (G)		x	2
Cord Grass (S)	x	x	2		Prickly Lettuce	x	x	22
Corn Salad		x	5		Prickly Sowthistle			77
Cotoneaster	x		na		Primrose		x	54
Cow Parsley	x	x	94		Purple Toadflax	x		14
Cowslip	x		45		Ragwort	x	x	78
Creeping Buttercup		x	96		Ramsons		x	37
Creeping Cinquefoil	x		87		Rape	x		9
Creeping Thistle	x		96		Red Bartsia	x		19

Crow Garlic	x	x	50		Red Valerian	x	x	24
Cut-leaf Cranesbill	x		80		Ribwort Plantain	x	x	94
Daffodil	x	x	na		Rose Bay Willowherb	x		60
Daisy	x		92		Rose of Sharon (G)	x		2
Dandelion	x	x	100		Rosy garlic		x	0
Dog Rose	x	x	50		Rough Chervil		x	42
Doves-foot Cranesbill	x	x	52		Round-leaved Cranesbill	x	x	18
Dusky Cranesbill (G)		x	na		Russian Vine (G)	x		19
English Scurvy Grass (S)	x	x	5		Scarlet pimpernel	x		37
Evening Primrose	x		5		Sea Aster (S)	x	x	6
Feverfew	x	x	17		Sea Couch Grass (S)	x	x	2
Field bindweed	x		78		Sea Plantain (S)	x		2
Field Madder	x		16		Self Heal	x		73
Fleabane	x		30		Shasta Daisy (G)	x		na
Fly Honeysuckle	x		na		Shepherds Purse	x	x	81
Fools Parsley	x		26		Smooth Hawksbeard	x		50
Forget me not		x	58		Smooth Sow Thistle	x	x	74
Garlic Mustard	x	x	84		Snapdragon	x		9
Giant Hogweed		x	2		Spear Thistle	x	x	94
Goatsbeard	x		44		Spear-leaved Orache (S)	x	x	29
Gorse		x	18		Tansy	x		12
Grape Hyacinth	x	x	1		Teazel	x		58
Great Hairy Willowherb	x	x	84		Trailing Bellflower		x	1
Greater Sea Spurrey (S)	x		2		Tutsan	x		4
Groundsel	x	x	81		Vervain	x		16
Great Mullein	x		22		Wall Lettuce	x	x	15
Hawkweed	x		na		Wall Rocket	x		7
Hedge Mustard	x	x	69		Wall Speedwell	x		27
Hedge Woundwort		x	89		White Clover	x		93
Hemlock Water-dropwort	x	x	44		White Deadnettle		x	78
Hemp Agrimony	x	x	39		White Stonecrop	x		10
Herb Robert	x	x	89		Wild Celery (S)	x	x	5
Hoary Willowherb	x		42		Wintercress	x		27
Hogweed	x	x	95		Wood Avens	x		74
Honesty	x		11		Yarrow	x		91
Hop	x	x	23		Yellow Fumitory		x	13

Table 3. Butterflies found at Butterfly Junction, 2003-2006

Brimstone	Orange Tip
Clouded Yellow	Painted Lady
Comma	Peacock
Common Blue	Red Admiral
Gatekeeper	Ringlet
Green-veined White	Small Copper
Large Skipper	Small Skipper
Large White	Small Tortoiseshell
Marbled White	Small White
Meadow Brown	Speckled Wood

Table 4. Birds observed on the Cut 2005-2006

Blackbird	House Sparrow
Black-headed Gull	Jackdaw
Blue Tit	Jay
Chaffinch	Kestrel
Chiffchaff	Kingfisher
Collared Dove	Lesser Black-backed Gull
Cormorant	Long-tailed Tit
Crow	Magpie
Dunnock	Mallard
Feral Pigeon	Mediterranean Gull
Goldcrest	Moorhen
Goldfinch	Redshank
Great Black-backed Gull	Robin
Greenfinch	Sand Martin
Grey Wagtail	Common Sandpiper
Heron	Wood Pigeon
Herring Gull	Wren
House Martin	

St. George's Flower Bank – Local Nature Reserve

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(The flower bank lies on either side of the A369 at St. George's Hill Easton-in-Gordano, close to the M5 junction 19. It has sloping verges, is on a gradient, and has a considerable seed-bank.)

"If not odd jobs for the Council, why are you on the roadside in yellow tabards?" [1]
"You're doing such a good job, keeping it so tidy" [2]
"A wonderful show of wildflowers, you must have a good seed mixture" [3].

It's good to be noticed but the comments show not everyone understands completely what we do. The story goes back a long way. In 1990 my life changed direction. For over 30 years I'd travelled from Pill to school and work in Bristol. Then for six years I went the other way to Weston-super-Mare. I've retired but that change continues to influence my life.

I was born immediately after the Second World War. All my spare time was spent outside locally, playing or helping on farms before working as a farm boy for a couple of years. Through Young Farmers' Club I learned about the advances in agriculture making this country's farmers the most effective and efficient food producers anywhere. It made sense then and we didn't notice any adverse effects. Bird watching trips were productive and flowers were in plentiful supply.

But going to work onto the M5, via the A369, something brought home to me that this wasn't the case. The roadside bank at St.George's Hill, where it had been widened and straightened in the early 1970s, had suddenly come alive with Primroses that were otherwise rarely seen. Changes in farming practices had developed to such an extent that the flowers were far less widespread. Demands for cheap food forced farmers to become ever more efficient and productive. Hedges have gone, fields ploughed and fertilised, and crops kept "clean" with pesticides and herbicides. I hadn't noticed.

But action was needed as the bank was being overwhelmed by brambles and seedling trees. I cleared them. I didn't tell the local authority though - if I didn't ask they couldn't tell me to stop! By 1996 I'd kept an increasingly large area clear and more species of flower were showing, including orchids. North Somerset Council was now keen on improving roadside verges so I made contact. A site visit followed and a contractor hired to clear areas, remove some larger trees and treat the stumps. I learned to

remove nutrients by "haycropping" to give the less vigorous wildflowers a chance. A local couple volunteered to help, tools were borrowed. Being in the public eye our efforts became well known and more help was offered. We were in business.

The regime we use replicates old hay-meadow management. Summer flowering plants are allowed to seed before being cut. [(2) This is when it looks "tidy"]. Raking opens up the sward to allow germination; removing the "arisings" reduces nutrient levels. Brambles, tree seedlings, nettles, docks and vigorous grasses that typify this sort of habitat are inhibited. Gradually conditions change to favour those wildflowers that are in such short supply.

Momentum began to build up. Through North Somerset Wildlife Wardens I heard of a National Lottery award scheme. I was one of several people locally to benefit from the Bristol Zoo Millennium Awards for Conservation. A generous grant funded machinery and protective equipment – apart from the normal dangers working with sharp tools we are within feet of traffic travelling at 60 m.p.h. [(1) Hence the reflective jerkins.]

The site is about 1,000 yards long with a variety of terrain and habitat. A plantation of native trees has been established; American Elm replace a stand of English Elm killed by Dutch Elm Disease, and two native *Sorbus* have been introduced. Near the Millennium village sign some garden flowers have been planted but on the majority of the site the plants are self-established. [(3) It's the hard work of management that allows this to happen – not a seed-mix]

Over the years a total of over 240 plant species have been recorded. Including introductions, garden escapes and mistaken identity this is staggering. Rupert Higgins of Wessex Ecological and Avon Wildlife Trust conducted a survey in 2004 when he found 157 species, which he described as "outstanding for a relatively small site". Included in his list are nine Avon Notable species, and 24 Grassland Indicator species. There have been 28 types of fungus recorded. In 2006 Tony Smith investigated the invertebrates, recording over 80 species including two types of weevil never previously recorded in Somerset [one not confirmed].See below.

Not only is the management successful, public support is very generous – both in compliments and cash. Shortly we should be able to announce that the site will be upgraded from a Wildlife Site to a Local Nature Reserve, a significant step in status giving better protection.

There is a downside. The site is vulnerable to damage by vehicles and contractors who fail to check its significance. Rubbish is a considerable nuisance. There is a danger of development – but we appear to have won a battle against losing land to enhance the proposed 'Showcase Bus Route'. Another danger of damage is that caused by plant "enthusiasts". Everyone who wants to enjoy the results of our efforts is most welcome but there are some who are insensitive to the effect they have. One such man told me he belonged to an orchid society [I don't remember which] but he seemed unable to appreciate that the whole plant community is valuable. He seemed only able to see orchids with no idea of the damage he was causing searching for them.
Our group of volunteers undertakes the management and basic plant surveying. We have yet to survey small mammals or mosses and will continue to work on the plants and invertebrates so there are always opportunities–apart from the physical work of scrub-removal and haymaking.

To find out more, get a leaflet, or offer to help, contact Bob Buck 01275 373750 e-mail robert@buck.freeserve.co.uk or check out the parish website at www.easton-in-gordano.org.uk

Invertebrates of St George's Flower bank.

Tony Smith

I was invited by Bob Buck to find out something of the insect life in the Flower bank. In April and August 2006 and again in 2007 I swept the area with a sweep-net for insects and such things. I tapped the bushes and brambles with a stick to shake out any others and I looked out for anything else that was present. I did not cover the whole ground but took sweeps over representative areas from north to south on both sides of the road.

It is amazing what a great range of creatures was present in 2006. I did not identify everything myself, sending spiders and bees, wasps and ants to specialists – who love to do the identifying.

In total there were 86 species recorded on the site, snails, woodlice, springtails, earwigs, grasshoppers, 14 different true bugs and hoppers and 22 different sorts of beetle. There were several colonies of ants of two different species, two common bumblebees, three bee species and one ichneumon. There were also 11 different flies, some in large number and they included the Bee fly, two hoverflies and eight others, some of most peculiar shape. There was only the Burnet Moth that I recognised (and maybe others). Finally, there were 19 different spiders from ten different spider families.

Towerhouse Wood, and Spilsbury Wood, Wraxall

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This ancient woodland (NGR ST475719) that is designated as a Site of County Wide Importance, covers an area of 16.5 acres (6.5 ha). It was purchased by the Woodland Trust in 1992 with financial assistance from the Countryside Commission and Nailsea Town Council. Local residents generously contributed the balance of the purchase price. It is now part of the Forest of Avon, the Community Forest that surrounds Bristol. Ancient woodland is defined as that which has been under continuous cover since at least 1600 AD. The wood may be entered from Towerhouse Lane, or from the footpaths leading from Riverway (W2), from Greenfield Crescent (W1), or from Jacklands Bridge on the Clevedon Road (T14 or T16).

Although there is space for one car outside the main gate on Towerhouse Lane, parking there is restricted and it is best to leave cars in Greenfield Crescent in Nailsea and to walk from W1 to the Trout Farm, then to use T12 and W9. It is also possible to leave a car at the end of Stonehenge Lane, which enters the Wood from Tickenham Hill (B3128) and to walk eastwards along W9.

The Wood occupies a south-facing slope of the Tickenham ridge, and the rocks tend to be close to the surface, probably making it difficult to cultivate, and for this reason it has probably always been wooded. There are some ancient boundary markers in the Wood, notably the veteran oak trees on the south edge, and evidence of ditch and hedge along the main east-west path. The west side of the wood is marked by the ditch and wall that denotes the Tickenham – Wraxall parish boundaries.

Woodland

Management of Towerhouse Wood is by coppicing on an eight to ten year cycle in small areas (Woodland Trust, 2004), leaving some of the cut wood to encourage invertebrates and fungi. The stumps remaining in the ground form shoots that eventually restore the tree cover. In this way, the wood can maintain a greater diversity of wildlife. In the last coppicing in 1999 some of the cut timber was converted to charcoal on site. Unfortunately, the coppiced area was immediately occupied by bramble thicket, and the lowest layer of woodland flora did not flourish. With natural loss of trees by wind throw, these are usually cut when paths are blocked.

The Wood includes many well established Ash (*Fraxinus excelsior*), Pedunculate Oak (*Quercus robur*), Field Maple (*Acer campestre*), Beech (*Fagus sylvatica*), Wych Elm (*Ulmus glabra*) and Birch (*Betula pendula*) trees. There are some large old Ash coppice stools and ancient pollarded Oaks on the southern boundary. The understorey is mainly Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Holly (*Ilex aquifolium*) and Spindle (*Euonymus europaeus*). Close to the north east entrance is a Small-leaved Lime (*Tilia cordata*) tree, a good indicator of ancient woodland that has almost certainly been coppiced. A substantial multi-stemmed coppiced Sweet Chestnut (*Castanea sativa*) is found on the main footpath.

Throughout the Wood there are many Turkey Oak (*Quercus cerris*) which seem to become dominant in places. Since it would be expensive to fell these trees, some of which are now very substantial, the Woodland Trust policy is to remove seedlings to prevent regeneration. There are many Yew (*Taxus baccata*) and some of these are host to the Artichoke Gall Fly

(*Taxomyia taxi),* which forms small leaf clusters in the terminal buds. This is one of the very few insects that is able to use the toxic foliage. Most holly bushes here show evidence of the leaf miner fly *Phytomyza ilicis*.

Many non-native trees have been planted to the north of the main east-west path, now mostly about 60 years old. These include Douglas Fir (*Pseudotsuga menziesii*), Corsican Pine (*Pinus nigra* ssp *maritima*), Monterey Cypress (*Cupressus macrocarpa*) and Larch (*Larix decidua*). There were thickets of Box Honeysuckle (*Lonicera nitida*) and Syringa (*Philadelphus coronarius*), which have now been removed. Other aliens include *Rhododendron ponticum, Mahonia aquifolium,* Portuguese Laurel (*Prunus lusitanica*) and Cherry Laurel (*Prunus laurocerasus*). With a concerted effort in 2002 many of these were removed, but it is now clear that continuing work will be needed to control these aggressive aliens.

Close to the main entrance in an area not owned by the Woodland Trust there is a particularly good specimen of the Coast Redwood (*Sequoia sempervirens*). The spring line at the southern boundary of the wood gives marshy areas of Alder (*Alnus glutinosa*) carr and good quality rhynes and ponds. An ecological survey of the Wood was conducted by Dr C.J. Smith in 2002.

The main threat to the Wood is from vandalism. Attempts to construct major mountain bike runs have been averted, on one occasion with the help of the police. Several fires have been started close to and even inside trees, which fortunately survived. There has been some evidence of substance abuse in the Wood, though this seems to be declining. Over-enthusiastic contractors are sometimes responsible for excessive strimming near to the paths, and a substantial English Oak was inadvertently felled in 2004.
A leaflet is available in a dispenser near to the main entrance in Towerhouse Lane. The interpretation board installed by the Woodland Trust in 2000 disappeared for several years, mysteriously re-appeared, and has now been restored to its original posts on the upper path (W9).

The clearance of urban rubbish is a continuing task. Much of it is easily collected and removed during routine visits, but some is quite large and time consuming.

Plants
The woodland is carpeted with Ramsons (Wild Garlic, *Allium ursinum*), Bluebells (*Hyacinthoides non-scripta*) and white Wood Anemones (*Anemone nemorosa*) in the spring, and there are several Early Purple

Orchids (*Orchis mascula*). These plants flower before the canopy of tree leaves close in to darken the woodland floor. Dog's Mercury (*Mercurialis perennis*), Wood Melick (*Melica uniflora*), Bugle (*Ajuga reptans*), Arum (*Arum maculatum*), Pignut (*Conopodium majus*) Spurge Laurel (*Daphne laureola*), Violets (*Viola reichenbachiana* and *V. riviniana*) and Primroses (*Primula vulgaris*) are also found, while in the wetter places to the south is Hemlock Water Dropwort (*Oenanthe crocata*). Himalayan Balsam (*Impatiens glandulifera*), (Plate 1) a plant that is known to favour water-sides and damp woodland, has become established close to the path leading to the Wood from the Trout Farm. This is a particularly aggressive alien (classed as a high-impact neophyte) that has colonised large areas of the countryside, displacing our native flora. It has very pretty pink flowers that are attractive to insects. We are removing this plant by pulling, since this is very easy, but it will be a task that will be needed for several years.
Several kinds of fern grow here - Hart's Tongue (*Phyllitis scolopendrium*), the Soft Shield Fern (*Polystichum setiferum*), Male fern (*Dryopteris filix-mas*), Broad Buckler fern (*D. dilatata*), and Bracken (*Pteridium aquilinum*). Rotting wood provides a large number of fungi in the autumn, but the black balls of King Alfred's Cakes (*Daldinia concentrica*) (Plate 2) growing on dead Ash wood can be seen throughout the year. The Funnel Cap (*Clitocybe* sp), Turkey Tail (*Trametes versicolor*) Birch Polypore (*Piptoporus betulinus*), Parasol Mushroom (*Macrolepiota procera*) and Dryad's Saddle (*Polyporus squamosus*) have been recorded. The dramatic Beef Steak Fungus *Fistuline hepatica*, (Plate 3) is found on old oaks and the trunks of some trees are coloured bright yellow with the filamentous alga *Trentepohlia aurea.* This alga sometimes grows symbiotically with fungi to form lichens.

The Veteran Oaks

One of the four ancient oak pollards on the lower path collapsed in October 2000, the ring count indicating that it could be up to 400 years old. This tree was called the 'Polo Oak', (Plate4) after a hole in one of the branches, and this name is now carved into the cut trunk, financed by Yansec, the administrators of the land-fill tax. Below this may be found a seat constructed from the timber, where it is possible to see across the neighbouring fields. Another of the oaks has long nails driven at intervals into the trunk, used by generations of children as climbing footholds.

History

Just beyond the southern boundary of the wood is a Mesolithic site (ST475717), occupied 6000 to 12,000 years ago, which was excavated in 1956 and has evidence of flint working (Sykes and Whittle, 1959/1960).

This was re-investigated in April 1997 by Paula Gardiner of the Department of Archaeology, University of Bristol (1998). A little further to the east (ST 479719) an Iron Age bronze torc (SMR 00556) was found in the 19th century.
Closer to Nailsea to the south (ST 479716) are the remains of a Roman villa, which had a hypocaust and a mosaic floor, vandalised in the19th century (Sykes and Brown, 1961). Just outside the west boundary of the wood is a disused lime kiln (NSC register 03092).

Birds
A survey of birds by Roger Staples in 1997 showed the presence of 34 species in the Wood, and a further 13 species in the surrounding fields.
Notable birds include the Great Spotted (*Dendrocopos major*) and Green Woodpeckers (*Picus viridis*), Kestrels (*Falco tinnunculus*), and Sparrow Hawks (*Accipiter nisus*). Buzzards (*Buteo buteo*) are frequently seen and Tawny Owls (*Strix aluco*) are known to use the Wood. Tree Creeper (*Certhia familiaris*) , Nuthatch (*Sitta europaea*) and Goldcrest (*Regulus regulus*) have also been found.

Jeffery Boswall, well known for his knowledge of birdsong, has given annual Dawn Chorus walks in the Wood since 2004 usually beginning at 4am. These have been very well attended despite the early start. Many nesting boxes have been installed, though of the two Owl boxes, so far only one has been occupied, - by Great Tits (*Parus major*)!

Animals
At least four kinds of bat fly in this wood. The two species of the Common Pipistrelle (*P. pipistrellus* and *P. pygmaeus*) have been detected, distinguished by the frequency of their ultrasonic calls, together with Noctules (*Nyctalus noctula*), and Daubenton's (*Myotis daubentonii*) Bats which skim the water of the Trout Farm to the west of the Wood in their search for insects. Bat boxes have been placed around the Wood, though it is not known if these have been occupied. Foxes (*Vulpes vulpes*) are well established here.

Since Jeffery Boswall found a Dormouse (*Muscardinus avellanarius*) asleep in his garden close to Stoney Steep in Wraxall last year, and as they are also found further to the west along the Tickenham Ridge in the Avon Wildlife Trust reserve now managed by Keith Giles, it seems possible that they might also be found within Towerhouse Wood, which lies between these two points. In the early 1990s Jenny Gladstone, who was the warden for this Wood at that time, also found one of these drowned in a water butt at her house nearby.

The Wood has a plentiful supply of Hazel and it could be an ideal habitat for Dormice. Having talked with James Field (Avon Wildlife Trust) about this, Gill Brown and Lindsay Moore have installed about 30 'dormice tubes' that are used for monitoring. These consist of plastic tunnels 6cm square and about 25 cm long) fitted with wooden floors with one closed end, that are attached to Hazel branches with the open end pointing towards the tree. It seems that the Dormice cannot resist the offer of a warm house! Until we find definite evidence for Dormice in the Wood, we are able to open the tubes under the license given to James. If Dormice are found, we will then install more permanent wooden boxes. Meanwhile, Gill Brown is training to acquire a Dormouse handling license.

On a visit in 2006, an Otter spraint was found by one of James' colleagues close to the pond in the SW corner of the Wood. This is a new record for this site. Fish at the nearby Trout Farm have been found partially eaten on the bank, almost certainly as a result of Otter activity.
There are several active Badger (*Meles meles*) setts in the Wood, and Foxes (*Vulpes vulpes*) have been seen close to the Wood. There is some evidence of Roe Deer (*Capreolus capreolus*) damage to the bark on some trees, and there are many Grey Squirrels (*Sciurus carolinensis*) that can also damage the trees. A pair of Stoats (*Mustela erminea*) has also been observed.

Geology
In the north, the wood is situated on Carboniferous limestone, and to the south on the red Mercian Mudstone. In the southwest corner of the wood there is a pond in which bubbles of gas are being constantly produced. (Plate 5) It was thought that this gas might be methane associated with the coal deposits known to occur under Nailsea. However in collaboration with British Gas it was shown that this gas is mainly air containing 8% carbon dioxide. It is not easy to account for the production of these bubbles, but some possible explanations depend on the presence of a cave system beneath the hill. Other underground water courses in the UK are known to produce similar gas bubbles, though the concentration of carbon dioxide is usually much less. (Smith, 2001). By comparing the ratio of the two stable isotopes of carbon (atomic weights 12 and 13) in the gas, it was established that the carbon dioxide is of relatively recent origin, and is not derived from the carbon sequestered in the Carboniferous period. No evidence of methane could be found, and the isotope ratio would be compatible with gas of bacterial origin. The mechanism for the formation of the bubbles is still unknown.

Probably associated with the lime kiln, there are signs of quarrying throughout the Wood. In wet seasons, several springs appear on the southern border, some with a very fast flow, feeding the stream that leads to the pond.

There is a printed guide available from the dispenser at the entrance to Towerhouse Wood. The Woodland Trust may be contacted at Autumn Park, Dysart Road, Grantham, Lincolnshire, NG31 6LL. tel. 0147 6581111 www.woodlandtrust.org. The WT Woodland Officer for the South West is Jaime Needler.

Further information on Towerhouse Wood may be found on the website www.nailseanature.org.uk.

Spilsbury Wood

In 2005 an adjacent area of 1.5 acres, mainly of more recent woodland, was donated to Nailsea Town Council by Dr Sarah Spilsbury and the Revd Paul Spilsbury to be held as a public amenity. This is ancient woodland towards the southern boundary and it has considerable potential for its wildlife interest. Sarah and Paul have also given funds that could be used to improve the quality of this woodland and of the adjacent Towerhouse Wood, particularly by adding to their biodiversity. Unfortunately this woodland had been used as a repository for vandalised cars, but these were eventually removed by North Somerset Council at considerable expense. In order to prevent further car dumping, six 2-tonne boulders were donated by Shipham Quarries and placed above the entrance to the Wood. This woodland is not contiguous with the area of Towerhouse Wood owned by the Woodland Trust. It is separated from this by a triangle of land leading from the main path towards the pond. This contains the ancient lime kiln, which is in poor condition and would benefit from restoration.

Jenny Dowell and Lindsay Moore (2004) have produced an ecological account of Spilsbury Wood. This included 21 different birds, 61 species of higher plants, 21 moss species, 3 liverworts, and two fungi. Only the lower third of Spilsbury Wood is on the Ancient Woodland Inventory, but a number of ancient woodland indicator species were found scattered throughout the wood. Notable species were Bluebell (*Hyacinthoides non-scripta*) (Plate 6), Spurge Laurel (*Daphne laureola*), Stinking Iris (*Iris foetidissima*) and Early-purple Orchid (*Orchis mascula*).

In 2004 a group called the Friends of Towerhouse Wood was established 'to assist in the management of Towerhouse Wood and of other woodland in the vicinity of Nailsea for the benefit of the wildlife and the community'. There are now 65 members who receive a regular newsletter, and new members would be welcome.

These areas of woodland are of great value for their biodiversity and aesthetic value, and they are a great benefit as a public amenity, since there are no access restrictions for walkers. However, the proximity to the urban areas of Nailsea makes them vulnerable to degradation, though with intensive protection by local volunteers, the woodland appears to be quite resilient. The removal of artefacts – rubbish, old barbed wire and other evidence of urbanization, is a priority.
The protection of the existing biodiversity is also essential, as is the elimination of alien plants that spread from local gardens. The Friends have sponsored many activities in the wood, like litter collection, and guided walks, some specifically for children.

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Tree Names

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On reading the book 'Trees in Your Ground' (published by the Tree Council and free to registered Tree Wardens) I was intrigued to find the statement 'the yew ..... has left relatively few examples of its presence in today's place names', and I was able to confirm this on consulting my AA gazetteer. I also found that the BT Telephone Directory indicated that no surnames in this area seemed to be directly related to that tree, despite its wide distribution. I therefore investigated the associations of other trees with place names and surnames. Not surprisingly, tree- and timber-centred activities were quite frequent in the list – Wood(s), Turner, Woodley (a 'ley' is a field), Hewitt, Grove, Thorn(e), Orchard, Hedges, Pollard, Sawyer, Carpenter, Forrest, Twigg(s) and Field. The latter word may be derived from the term 'felled' where a clearance had been made. There is only one Thickett but no Spinneys. Haywards in time past were those placed in charge of hedges – hedge wardens.

I'm sure that many additions can be made to this list and I would be grateful for suggestions.

To be more specific, probably the overall winner is 'Ash' with surnames like Ashman, Ashby, and place names like Ashbourne and Ashcombe. Oak comes a close second, with Oakley, Oakham, and occupations like Cooper, Barker and Tanner. The Lime tree is well represented with names like Lindley, and even Linnaeus derived his name from his father who owned a field in which three Lime trees grew. Beech is not uncommon, and place names like Buckingham and Buckfast probably have this origin. As an aside it may not be commonly known that the word 'book' is derived from Beech, and the two words in Swedish are identical. This is because early books were bound in Beech boards. Holly, like Yew, is rarely used, but more specific references include Rowntree (rowan), Juniper, and there are three Sycamores in the telephone directory, but only one Poplar!
But don't be misled. All is not quite as it might seem. For instance, the name Ashlands at Portishead is derived from the pulverised fuel ash from the power station on which this development has been built.

The Street Trees of Bristol

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My interest in street trees was inspired by the article by Tony Titchen and the late Alan Grenfell in the 1991 Volume of the Society's Proceedings. The streets of Bristol are, in effect, a linear arboretum, a fascinating and exceptional collection of at least 113 tree species dating back over a century.

The History of street trees in Bristol.

Hofnagle's Bristol map of 1581 shows no trees either on The Marsh, which was to become Queen's Square, or on College Green. But the seventeenth century was a great time for planting avenues. All the best country houses had avenues, often of Common Lime and, by the time of Millerd's map of 1673, there are trees planted around Queens Square and College Green. Both these sites have had trees continuously since then, though none of the present trees are original. The oldest avenue of trees that still exist in Bristol is the avenue of Common Limes leading up the driveway of Kings Weston house, which clearly date back to 1715 when the house was opened. They are not the oldest trees in the city, and they are now park trees rather than street trees, but they are magnificent.

College Green.

In 1673 Millerd shows an avenue along what would become the diagonal of the Green, as Park Steet had yet to be made. There is also a single line alongside the Cathedral Chancel. By 1734, shown in the NW prospect of Bristol by Nathanial Buck, there is an avenue along the length of the Cathedral, the diagonal avenue, and just three trees along Park Street, now built up. By 1742 the Roque map shows a much more complex planting, with a double row on all three sides of the Green, and across two diagonals to make a sort of kite shape. By 1826 the diagonal planting had gone, but there is a photograph of the double row around the whole triangle from between 1851 and 1855 in Reece Winstone (Earliest Photos no 61). The inner row was felled in 1927, but the row along the Council House remained until all were felled in 1950, and the height of the Green reduced by about a metre to set the scene for the new Council House. The last pictures can be seen in Reece Winstone, 1950-53 no 46. The barren College Green, bereft of trees for the first time in at least 278 years can be seen in the same volume, no 90. Later it was decided to plant Silver Maples and London Planes on a random basis on the Green.

Queen's Square.
Millerd's 1673 map shows The Marsh with a single line of trees round two sides, and an avenue along Marsh Street and another along the Quay. By 1710 his next map shows the whole square built up as it is today, with a fence around it and a single line of trees. Two rows of trees had been planted in 1705. By 1742 Rocque shows a triple line of trees but by 1780 there is a double line, and trees on both sides of two cross walks that meet at the statue. These crosswalks have gone by 1826, but the double line remains to the present day. There is a picture by Samuel Jackson of 1824 (F.Greenacre, The Bristol Landscape, p25) showing both a newly planted tree and pollarding, and other drawings from that date indicated that there was some inter-planting. The trees feature in the dramatic drawings of the 1832 riots, and must have been damaged in the fires, but Reece Winstone's photo of 1850 (Queen's Square, p43) still shows substantial trees. The largest modern Plane tree has a girth of 430cm which implies a planting date of around 1880. Reece Winstone's 1895 photo (1845-1900, no 174) shows some very straggly young trees that are almost certainly the present ones. Successive reorganisations of the square, and a mini tornado in c 1980, have led to further replanting.

Other early evidence of street trees is shown on Millerd's 1673 map. There were a few trees on Old Market, and a line along Redcliffe Back, but there is no later sign of these. St James Church also had an avenue up to the south porch, and trees all round the churchyard. It still has trees today, though they clearly don't date back 300 years. The Ropewalk on Canons Marsh south of the cathedral is shown as tree-lined in 1742, and as late as 1828. Some 18C drawings show the view of the cathedral across these trees.

Hotwell House.
The next road to have trees planted on it was the road that approached the Hotwell House. A drawing of 1730 shows no trees but one of 1747 shows a line of very young trees, confirmed by a map of 1787. They lined the area in front of St Vincent's Parade. The trees appear in a series of views of the Hotwell House, and in a photo of 1858 and on Lavars map of 1887. The last photo to show them is about 1875, when they are exactly on the line of the present Portway, and mask the façade of the existing terrace (Reece Winstone, 1879-1874, no 128). The original Hotwell House was built in 1696, and replaced in 1822. This allowed a road to be built between the river and the new Hotwell House which led up Bridge Valley Road to Clifton. The new house itself was demolished in 1867 to enable the river to be widened and improve the approach to Cumberland Basin.
A map of the 1840s shows Stokes Croft, the main road out of the city to Gloucester, with a line of trees. There are two spindly young Planes today.

Downs.
There were avenues planted on the roads across the Downs shown clearly in a map of 1746. Stoke Road and Westbury Road were tree lined and there were some trees on the Grand Avenue in the 1826 Donne map. By 1887 a lot of these have gone, though they were soon to be replaced. In the 1880s Huntingdon Elms were planted and there are pictures of them from 1914 on. They were hit by Dutch Elm Disease in 1976 and progressively felled, the penultimate one on the bend of Upper Belgrave Road in 2006. They were replaced by what were meant to be Small-leaved Limes, *Tilia cordata* but which are actually a miscellany of lime species, along Ladies Mile in particular.

Clifton Green.
Donne's map of 1821 shows an avenue from the top of the road to Sion Hill down to the bottom of the Green opposite Manilla Hall. It is said that General Draper, the first conservator of the Downs, planted these after 1767 when he was appointed. None of these trees survives, and the oldest present tree on the Green is a Horse Chestnut *Aesculus hippocastanum* from 1880. Ashmead's 1833 maps shows trees planted at the north end of the Promenade, though there are no houses there yet, and a line on the edge of the road fronting Christ Church. In 1849 a map shows the beginnings of the avenue along the Promenade and by 1887 there is a full avenue the whole of its length. A picture from the 1880s shows the avenue full of people walking up the Promenade towards the Camp. This is now a Beech, *Fagus sylvatica,* avenue but the trees are less than a century old. The Avenue has recently been extended up the hill, though a number of trees have failed to take, often because of drought. Interestingly one of the line, near Proctor's Fountain, is a Hornbeam, *Carpinus betulus*, not a Beech, and the confusion between the two species can easily be made in winter in a nursery, as both keep their leaves.

Whiteladies Road. An 1852 photo of the bottom of Whiteladies Road shows trees, and they appear on Lavars 1887 map. There are a series of more recent photos of these trees. There are now two huge London Planes *Platanus x hispanica* with girths of 460cm and 440 cm which are likely to have been planted in the 1870s, and are probably now the oldest street trees in the city. (Plate 7)

Colston Avenue. The ancient centre of the city was so intensely developed that there is no sign of any other significant street trees until part of the Frome was covered in 1893 to create Colston Avenue. This was planted with the Plane trees that are still there and provide a fine setting for the Cenotaph, opened in 1931. They are just over four metres in girth.

Redland.
Lover's Walk in Redland is an example of trees laid out originally as part of the approach to Redland Court. They became street trees when the land was developed for housing. They appear on the Donne map of 1826. They are Common Lime *Tilia x europea* trees, and the existing trees measure about 250cm in girth, and hence would have been planted about 1860. (Lime trees grow much more slowly than most other trees. The ones on College Road are known to have been planted in 1862 and have grown at a rate of between 18 and 21 mm a year, compared with the normal average of 26, and the Colston Avenue Plane tree at 36mm.) However Reece Winston has a photo of the Lover's Walk trees in the summer of 1858, (1850s no 60), and three very small saplings can be seen that must be the present trees. The original trees were Elms *Ulmus* sp.

As the suburbs of Redland, Clifton and Montpelier developed from the 1850s trees began to be planted as part of the expansion. The Avenue in Clifton, built in the 1870s has a wide grass strip on either side of the road planted with Common Lime and Horse Chestnut in alternate pairs, giving the appearance of a grand avenue. Cambridge Park, in Redland, of about the same date, has trees actually planted in the road space, with a pavement on either side, and Pembroke Vale also has Plane trees in the road.

The urban expansion of south and east Bristol, associated with mining, tobacco and boots, which took place between 1890 and 1914 was not accompanied by tree planting. The post war development of NW Bristol saw streets lined with Japanese Cherries *Prunus* sp or Box Elder *Acer negundo*, and the Hillfields estate of the 1920s had oaks and maples that are now very fine. Developments in the 1950s and 1960s used a wider range of species, including Norway Maple *Acer platanoides*, Rowans and Whitebeams *Sorbus* sp., Purple Plum *Prunus cerasifera "pissardii"*, and a variety of Crab Apples *Malus* sp. More recent plantings have included Pillar Apple, *Malus tschonskii*, an early flowering decorative Pear, *Pyrus calleyana* 'Chanticleer', and Ginkgo, *Ginkgo biloba*. Early plantings of particular species have suffered a variety of fates over the years, and been replaced by new species, and the trees thus form a historical record of tree fashions over time.

Street trees today.
Street trees have been defined as trees planted between the roadway and the private boundary of adjacent property. Trees in parks have not been included even if close to a roadway. Some trees on roundabouts and other road features have been included. This definition is often difficult to follow with precision. It omits screen plantings by private companies on their own

land. Motorway screen plantings have also been ignored and categorised as park planting. Street trees are constantly changing as individual specimens suffer from vandalism, or collisions with vehicles, though fears of widespread damage to roots from cable-laying have not materialised. The city has an excellent record of replacing dead trees with new ones, and where possible of ensuring new planting in new developments, usually as part of planning mitigation. There has been some excellent experimentation with new species, though there is an unfortunate tendency in some quarters to continue to plant species that are traditionally thought to be suitable for urban areas despite a great deal of evidence to the contrary.

This article is based on a survey done over the past five years, but mostly in 2002 and 2003, and it will already be out of date. Apart from identifying species, I have also plotted distribution by 1km square because this is the best way to plot both fauna and flora. The 2000 plant Atlas plots all wild species in this way, and the distribution of breeding birds of the city have also been mapped by 1km square.

The ideal street tree is naturally tough, fast growing, shapely, and grows strongly vertically rather than spreading, does not grow so large as to become a problem, reacts well to pruning and pollarding, is attractive in both flower and fruit, both of which contribute to its biodiversity value, does not sucker, is not aggressively water demanding (if it is it will soon find its way into sewers, and both break and block them), is not prone to disease or die back, is resistant to storm damage, and is long-lived. There is of course no such species, but there are a variety of nurseries producing trees that meet very many of these criteria, and it is possible today to find a species that will fit the specific requirements of many sites. Indeed street trees are increasingly planted to fit a planning brief, and are not expected to have long lives. A pragmatic approach, in which a planting scheme is devised for a central reservation or shopping mall which includes plants of many kinds with a few trees as a vertical feature, and whose maintenance includes the replacement of all the plants on a planned rotation, is increasingly common, and often much more logical than planting a tree that will last a century or more.

Today it is also frequently suggested that planting should be of native species, on the grounds that this will provide for greater biodiversity than alien species which have fewer species directly associated with them. The logic behind this is an article written in the Journal of Animal Ecology by TRE Southwood in 1961 examining the number of insect species associated in one way or another with each native tree species. The oak tree comes out

on top on this analysis. However this article only examined the relationship of native species with insects, and did not deal with the value of native or alien species to other forms of wildlife. An article in British Wildlife in October 2006 by K. Alexander examines the relationship of native and alien tree species to lichens and fungi, the value of their leaf litter, of their nectar and fruit for birds and mammals, and their value as nest and roost sites. He suggests that there is no alien tree species that is not of some value to native wildlife. A main reason for the exceptional value of towns in biodiversity terms is the extraordinary diversity of plants species within them, and street trees both native and alien are a significant part of that. Of the 113 species or varieties found on Bristol's streets, 31 are native. This includes several species that are sometimes classed as shrubs, Hawthorn, *Crategus oxyacantha*, Hazel, *Corylanus avellana*, Blackthorn, *Prunus spinosa*, and Box, *Buxus sempervirens*. I decided to include them because of their wider significance to wildlife. However it remains true both that almost all common native species can be found on our streets and that there are 82 species from the rest of the world. As over 300 tree species can be found in Bristol's parks and gardens, those on the streets are actually a small proportion of what might be found.

I have checked 105 1-km squares that lie within the city boundary and have residential streets, and of those 97 have one or more species of street tree. However some 13 species dominate our streets. They are listed in Table 1 showing the proportion of squares in which they are found.

Species	%	Species	%
Norway Maple	71	Silver Birch	44
Japanese Cherry	60	Rowan	44
Whitebeams	57	Ash	42
Large-leaved Lime	55	Purple Plum	36
London Plane	54	Apple	32
Common Lime	51	Horse Chestnut	30
Sycamore	46		

Table 1 The percentage of 105 one-km squares in which the most widespread species were found.

The commonest is **Norway Maple**, *Acer platanoides*, present in 71% of squares. It is a close relative of the Sycamore, and occurs in a very wide variety of forms often with striking spring or autumn colour. It is fast growing and vigorous. Seedlings propagate readily, and often out-compete native species. It is now very widespread in woodlands, and likely to

become more so over time. It is most visible in early autumn when the leaves turn a brilliant yellow. As a street tree it has mostly been planted in the last forty years.

Japanese Cherry, *Prunus serrulata* sp. which has dozens of forms which I have not attempted to distinguish, was very popular in the 1930s, and still is today. It is present in 60% of squares. It is relatively short lived, and very pretty for a short time in the spring, but otherwise has little to commend it, as most specimens are sterile. Blackbirds enjoy the fruit of those that are not.

Large-leafed Lime, *Tilia platyphyllos*, present in 55% of squares, is a very rare native species that today is preferred for street plantings to **Common Lime**, *Tilia x europaea*, present in 51%, because it does not produce the sticky aphid dew in summer, nor does it usually have the cluster of shoots at the base which Common Lime does. However in the past nurserymen found Common Lime much easier to propagate. Limes are slow-growing, and very tolerant of pollarding and pruning, and there are many mature specimens on our streets, some going back more than a century.

London Plane, *Platanus x hispanica*, is the traditional street tree, and present in 54% of squares. It was widely used in London in Victorian times as its habit of shedding its bark annually helped it withstand the heavy smoke pollution of the day. Central Bristol was as smoke-ridden as London, and London Planes were planted in Queen's Square when the original Common Limes, which were planted in the early 18th century when the square was laid out, succumbed to the pollution. The London Plane is a hybrid between the **Eastern Plane** *Platanus orientalis* and the **American Plane**, *Platanus occidentalis* and first appeared in 1680. A huge specimen of about that age can be seen at Dyrham Park. It is very fast growing, very amenable to quite savage pollarding and pruning, but has drawbacks. Its vigour means that it takes over pavements almost completely, as it has done at the bottom of Whiteladies Road, it buckles paving stones, its huge leaves block drains and decay very slowly, it produces no nectar, and its seeds are only eaten by Goldfinches. The fact that it is still being planted is surprising as the pollution that it resisted no longer exists.

Sycamore, *Acer pseudoplatanus*, present in 46% of squares, has the same habit of shedding its bark as the London Plane tree, and it is also vigorous, and does occur in some unusual forms, though these are rarely used as street trees. (Plate 8) It produces masses of nectar, and its leaves carry the heaviest aphid load of any tree so it is of value to other species. Its seeds spread themselves

widely, and the seedlings grow very rapidly wherever they can gain a foothold, even if it is your chimney or wall.

Silver Birch, *Betula pendula*, present in 44%, is a very graceful native species, very beautiful as its turns golden leaves contrast with its silver bark in the autumn. Its seeds last through the winter and are eaten by many small birds, and, though millions germinate, very few manage to out-compete annual plants. It is short-lived and does not grow very tall. Its drawback is that it takes time for the attractive bark to appear, it reacts badly to pruning, and readily takes on a lean. **Himalayan Birch**, *Betula utilis*, planted in 13% of squares, is a rather more shapely tree, with brilliant white bark which develops very rapidly as the tree grows.

Six species of **Whitebeam** are present, in 57% of squares. The commonest is the **Common Whitebeam**, *Sorbus aria*, and then the **Swedish Whitebeam**, *Sorbus intermedia*, which tends to have a more regular shape, and to keep its berries longer. **Bastard Whitebeam** *Sorbus x thuringiaca,* is present in eight squares, but is less successful. **Himalayan Whitebeam**, *Sorbus vestita*, a rare tree, is planted by Oldbury Court. There are many different species and forms of **Rowan**, *Sorbus aucuparia* sp. with a variety of different coloured fruit, but I have lumped them all together as identification is difficult. They are planted in 44% of squares. They are almost an ideal street tree, small, tough, fast growing, with attractive foliage, pretty flowers and wonderful red berries that everything likes to eat in winter. One of the surprises of the Waxwing invasion in 2005 was that they settled widely in towns where the Rowan trees are numerous not only in the streets, but in car-parks, parks and gardens. As a native species they are rare.

Common Ash, *Fraxinus excelsior*, is widely planted in 42% of squares. It is robust, its leaves cause few problems, and it can readily be pruned. But its flowers are dull, and Ash keys are eaten by few species other than Bullfinches. It is at present a hugely successful species as the seedlings can grow a metre in their first year, and as a result it is a problematic garden and urban weed.

The Purple Plum, *Prunus cerasifera 'pissardii'* which is a cultivated variant of a widespread introduced species, is planted in 36% of squares. It is the first tree in flower in the spring, and the flowers are rapidly followed by attractive reddish foliage that darkens through the year. It sometimes holds its leaves until very late in the season. It has a bushy form and stays

small, so that it needs little attention and is never a threat. *En masse* it can be rather overwhelming, and needs planting with more discretion than it often receives.

Horse Chestnut, *Aesculus hippocastanum*, was a nineteenth century favourite for avenues. It is widely used on the Downs and in 30% of squares. In many ways it is unsuitable as it tends to reacts badly to pruning and coppicing, and old trees as a result often look ugly. It is tough, very vigorous and fast growing, but it tends to spread widely, its large leaves clog drains, and the popularity of conkers for the young can create problems. Although many conkers germinate, rather few manage to survive in the wild, I suspect because they are very light demanding.

Species	Squares		Species	Squares
Silver Maple	26		Common Oak	18
Field Maple	19		Hornbeam	17
Box Elder	13		Beech	13
Cappadocian Maple	5		Pear	9
Paperbark Maple	3		*Pyrus calleyana*	4
Snakebark Maple	1		Holly	6
Italian Alder	25		Yew	6
Grey Alder	20		Box	2
Common Alder	7		Robinia	14
Hawthorn	17		Pillar Apple	13
Hybrid Cockspur Thorn	10		Narrow-leaved Ash	8
Tibetan Cherry	8		Lawson's Cypress	7
Almond	6		Laburnum	7
Plum	5		Hybrid Black Poplar	7

Table 2 Species present in five to 26 squares

Table 2 lists 26 species that are present in more than six squares. They can be analysed into six groups.

Maples. There are three frequent *Acer* species that together are present in 66% of squares. They are **Box Elder** *Acer negundo*, which was a favourite of the 1930s is present in 13 squares. It is a fairly small maple, with unusual leaves, which grows rapidly at first and is attractive when young, but becomes rather crabbed and ugly in old age. It is not planted today, but

many older plants remain. The **Silver Maple**, *Acer saccharinum*, is the popular species today. It has a very pretty leaf which is silvery on the underside and turns an attractive greeny yellow in the autumn. It has tiny flowers exceptionally early, and its seeds are shed at the end of May, but never seem to germinate. It actually grows very fast to make quite a large tree. It is present in 27 squares. The native **Field Maple**, *Acer campestre* present in 19 squares, is very familiar as a hedgerow plant, but rather more rarely allowed to grow to full size. It grows slowly, has a pretty small leaf which turn a brilliant yellow in some autumns, and usually fruits copiously, and often sets seedlings. It has much to commend it as a street tree.

There are three much less common maples. **Cappadocian Maple**, *Acer cappadocicum*, which is the only maple that suckers, and is thus very unsuitable for street planting. This species can also be found in Whiteladies Road, in Brislington and Bedminster Down. **Paperbark Maple**, *Acer griseum,* a very small tree with attractive peeling bark, and **Snakebark Maple**, *Acer davidii,* with stripey bark, are both rather rare.

Alders. There are three alder species which together occur in 49% of squares. The commonest is **Italian Alder**, *Alnus cordata*, present in 25 squares. It is very vigorous, grows to make a shapely columnar tree, keeps its shining glossy leaves until the end of December and has long attractive catkins in January. There seems to have been a vogue for planting it in the sixties, though I have found a few earlier trees. It has very large seed cases, and it will quite readily germinate. Quite a number of seedlings are present in the walls of the City Docks. The **Grey Alder**, *Alnus incana,* is present in 20 squares. It is also fast growing, smaller than Italian Alder, with long grey catkins in February. The native **Alder**, *Alnus glutinosa,* is only present in 7 squares. It is not happy away from water, and is perhaps a poor choice, though Siskins and Redpolls enjoy its seeds in winter.

Thorns. Two species of Hawthorn are widely used. The native **Midland Hawthorn**, *Crategus laevigata* Paul's Scarlet, a sterile red form, appears in 17 squares. Its flowers are very attractive in May, and it is a very tough tree that is easy to keep tidy. The **American hybrid thorn**, *Crategus x lavellii*, which has glossy tough semi-evergreen leaves, and large bright red berries is found in ten squares.

Prunus. There are three less common *Prunus* species. **Tibetan Cherry**, *Prunus serrula,* has wonderful copper-coloured bark, but in other ways is rather a straggly tree. **Almond**, *Prunus dulcis*, is only found in six squares, though its early pink blossom is as good as any. **Plum**, *Prunus domestica*,

which has white flowers in the early spring, is found in five squares.

Native species. Six native species can be found in a variety of situations. They are often trees stranded by development around them, and sometimes part of remnant hedges. The **Common Oak**, *Quercus robur*, is found in 18 squares, though it has very rarely been planted as a street tree. On the other hand **Hornbeam,** *Carpinus betulus,* is found in 17 squares, often as a variety with a very symmetrical and flame-shaped growth form. **Beech**, *Fagus sylvatica*, though unsuitable as a street tree as it grows too large, is readily clipped as a hedge and sometimes survives in that form. **Yew,** *Taxus baccata*, occurs in six squares is sometimes found on roundabouts where its evergreen nature is valuable. As it is readily clipped, and its fruit are a winter treat for many birds it is odd that it is not more used. **Common Pear**, *Pyrus communis* , is found in nine squares, usually planted for its spring flowers, and its vertical growth. The attractive early-flowering species *Pyrus calleyana 'Chanticleer'* has recently been planted in four squares. **Holly**, *Ilex aquifolium,* found in six squares, and **Box**, *Buxus sempervirens*, in two, are sometimes part of remnant hedges.

The final group is of six assorted species. **Pillar Apple**, *Malus tschonskii,* is a very attractive small apple that grows strongly vertically, has attractive flowers and fruit, and turns colour brilliantly in the autumn. It has only been planted in the past decade or so and is found in 13 squares. **Robinia**, *Robinia pseudacacia,* is a tough North American species with small white flowers in spring, and thorns, found in 14 squares. It can grow into a substantial tree, but has the advantage that it is reacts very well to pruning. **Narrow-leaved Ash**, *Fraxinus angustifolia*, present in eight squares is a very attractive small ash which turns a wonderful purple in the autumn. It does not appear to produce viable fruit. **Lawson's Cypress**, *Chamaecyparis lawsonii,* is a very common garden and park plant, available in a very large number of forms, found in seven squares, sometimes as part of a roundabout. **Laburnum**, *Laburnum anagyroides* was also found in seven squares, as was **Hyrbid Black Poplar**, *Populus x Canadensis* which in general grows too large to be a good street tree.

At the bottom end of the frequency table there are no fewer than 78 species that have been found present in four squares or fewer. Some of them are quite unusual species, and exactly how they came to be planted is often mysterious. It is often the case that nurseries make mistakes with an order, and I suspect that sometimes they simply send any species they have which have reached the age at which they must be planted on.

The rarest is the **Korean Euodia,** *Euodia hupehensis* planted at the top of St Michael's Hill as part of the Kingsdown development. This is an exceptional tree that flowers in August. There are only two others, in parks, in Bristol. **Roble**, *Northofagus obliqua*, has been planted in Wootton Road, St Anne's Park as part of the development of the old paper mill. In Charlecombe Road, Canford, there is a flourishing rare apple planted in the 1930s *Malus tricuspidata,* which has also recently been planted in Clifton. There is a **Dawn Redwood**, *Metasequoia glyptostroboides*, in Lower Knowle. Westbury-on-Trym has a **Manna Ash,** *Fraxinus ornus,* in Coombe Lane. **Eastern Plane,** *Platanus orientalis*, that is planted at the top of St John's road in Clifton may have been planted in error as all the other planes in the road are London Planes.

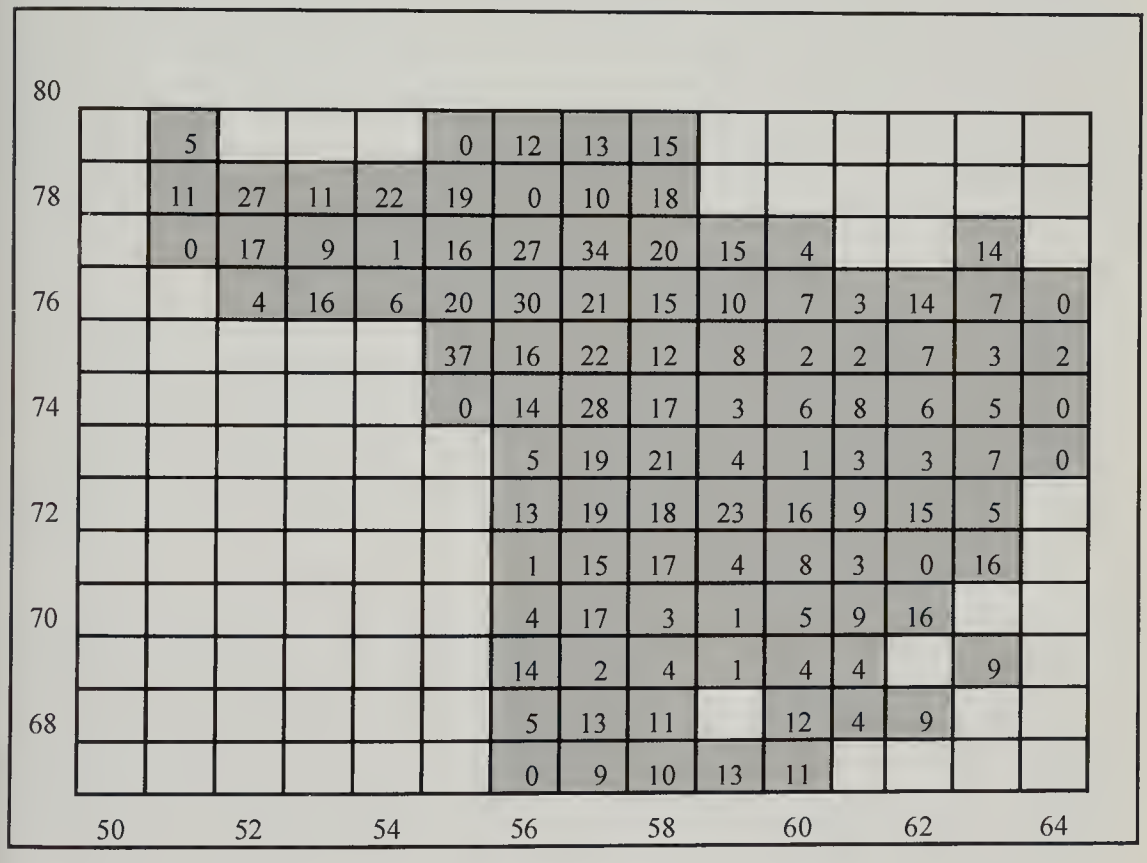
Sometimes a tree is left from a former estate. This is clearly the case of the **Atlas Cedar,** *Cedrus atlantica,* in the road on Durdham Park, Redland. The row of **Black Pines** *Pinus nigra*, along Mariner's Drive in Sneyd Park also look as if they derive from the past. There is also a **Cabbage Palm,** *Cordyline australis,* there, and a variety of other uncommon street species. In Shirehampton High Street there is a fine **Wellingtonia** *Sequoiadendron giganteum,* with a plaque. A photo of it as a baby tree in 1890 can be found in Reece-Winstone's 1845-1900 volume, no 443.

New planting around the city includes **Ginkgos**, *Ginkgo biloba* outside the Wills Tower, **Turkish Hazel**, *Corylus colurna,* by @Bristol, **Indian Bean Tree** *Catalpa bignonioides*, **Incense Cedar**, *Calocedrus decurrens* and early flowering Pear, though these may have given way to the New Broadmead. There is a superb **Silver Lime**, *Tilia tormentosa,* in Victoria Street, Redcliffe. In Avonmouth there has been a good deal of planting including **Bird Cherry** *Prunus padus*, **Ginkgo** *Ginkgo biloba* and **Snake Bark Maple** *Acer davidii.* Stoke Bishop has **Tulip Tree,** *Liriodendron tulipifera,* **Sweet Gum**, *Liquidamber styraciflua*, as well as *Eucalyptus gunnii* which can also be can be seen in Bishopston and the Temple Meads roundabout.

Species	Squares		Species	Squares
Bird Cherry	4		White Poplar	2
Black Pine	4		Wild Cherry	2
Cabbage Palm	4		Atlas Cedar	1
Grey Poplar	4		Balm of Gilead	1
Himalayan Cotoneaster	4		Bay	1
Laurel	4		Caucasian Lime	1
Sallow	4		Dawn Redwood	1
Silver Lime	4		Eastern Plane	1
Snowy Mespil	4		Green Ash	1
Sweet Chestnut	4		Himalayan Whitebeam	1
Sweetgum	4		Incense Cedar	1
Tulip Tree	4		Korean Euodia	1
Crack Willow	3		Larch	1
Hazel	3		Lilac	1
Italian Poplar	3		*Malus tricuspidata*	1
Osier	3		Manna Ash	1
Red Oak	3		Monterey Cypress	1
Small-leaved Lime	3		Pittosporum	1
Turkish Hazel	3		Red Chestnut	1
Walnut	3		Roble	1
Wellingtonia	3		Sorbus 'Wilfred Fox'	1
Blackthorn	2		Turkey Oak	1
Cherry Plum	2		Twisted Willow	1
Cider Gum	2		Vilmorin's Rowan	1
Crab	2		Violet Willow	1
English Elm	2		Weeping Ash	1
Ginkgo	2		Weeping Willow	1
Grey Willow	2		Western Red Cedar	1
Holm Oak	2		White Ash	1
Indian Bean Tree	2		White Willow	1
Leylandii	2		Winter Cherry	1
Prunus Amangowa	2		Wych Elm	1

Table 3 Species that have been found in four squares or fewer.

The distribution of species across the city is not even. At one end 8 squares have no street trees at all, and at the other 32 squares have more than 15 species, the richest being ST5575, Sneyd Park with 37 species. It is the north west of the city that has the greatest variety, and the east and south, that has the least. The new estates of the 1950s and 60s had comparatively little planting, nor did the industrial suburbs of the east built between 1890 and 1930, or the Avonmouth area, some of which remains undeveloped to this day. The importance of an attractive environment is at last being recognised by the planning system, and great strides have been made in recent years to improve the situation inherited from the past. The accumulation of a variety of species is largely a matter of the passage of time. The map shows the distribution found by this survey



Map of Bristol showing the number of species found in each 1-km square that has been checked.

Bristol's street trees are a wonderful heritage of which we must be proud, and which we must cherish and seek to enhance.

Forests of the future; tree regeneration in ST57

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Introduction

Whether a tree species naturally regenerates or not is affected by a variety of factors, including climate, and, as the climate is always changing, it seems appropriate that we should know which species are regenerating today, and how successfully.

In general, native species, having had ten thousand years to adapt to our changing climate, are likely to be more successful than species that originate in different places, with other climatic regimes. However some native species are far more successful than others, and some alien species are more successful than many natives. This is part of the process of change in our plant cover which itself is a product of the way all other factors in the ecosphere are changing. Some species of tree, such as the **Small-leaved Lime**, *Tilia cordata,* very rarely produce viable seed, because summers are no longer hot enough. Some, such as the **Common Elm**, *Ulmus procera*, have almost given up regenerating from seed in favour of suckers. Some, such as the **Common Oak**, *Quercus robur* are now suffering from a new gall which has the result that in many years there is hardly any viable seed at all. Furthermore since about 1900 a new fungal disease, Oak Wilt, has ensured that even when acorns germinate, in woodland with low light levels, they are likely to die in their first season. The **Hazel**, *Corylus avellana* still produces plenty of nuts, but in most years almost all are eaten by Grey Squirrels before they are ripe.

Some alien species have adapted very well to our conditions. **Norway Maple**, *Acer platanoides*, for instance, has seeds that germinate faster and grow better than all other woodland species, and can rapidly dominate an area. **Holm Oak**, *Quercus ilex* acorns are now planted in their thousands by Jays and Squirrels, and, though slow-growing at first, because they are evergreen and very tough they can take over whole hillsides as they have above Clevedon Court. **Laurel**, *Prunus laurocerus*, bushes whose fruit are a favourite of Blackbirds, have, as a result jumped over the garden wall, and invaded every woodland unless human action has intervened. Like **Rhododendron**, *Rhododendron ponticum*, whose spread is limited by the acidity of the soil, they destroy all plant life beneath their shade.

Survey Method

Regeneration on its own does not create the forests of the future, because human management at some point in the next century is likely to interfere to favour some species and remove others, and grazing pressure from deer, damage from Squirrels, and the impact of disease may well alter the balance in unpredictable ways. However it does give a pointer to the ways that plant communities may change in the future. Between November 2006 and February 2007 a survey was conducted through 91 of the 100 1-km squares in ST57, and a note made in each of the species of tree and shrub that were regenerating. ST57 was chosen because it is split between urban and rural areas, and also to some extent between areas with or without woodland, and it thus provides a wide variety of different habitats to challenge the capacity of different species to survive and prosper. An average of 35 minutes was spent walking through each 1-km square on public rights of way, and woodland was sought out where possible. Such a brief survey will readily pick up all the common species that are regenerating, but will miss those that are comparatively rare. It is highly likely that further survey work would alter the results, but the chances of a species being found were more or less the same for every species.

Results

60 species of tree and shrub were found regenerating, 30 of them native and 30 alien. 45 tree species were found and 15 shrub. Within Bristol 55 species were found, within N Somerset only 40. This might seem surprising, but the urban areas had a greater variety of alien species, and in N Somerset almost all the records were from woodland, as fields and hedges provide little opportunity for regeneration. The Bristol average numbers of species per square was 10.3, in N Somerset 13.6. However all squares with woodland, with an average of 18.6 species were much richer in species that those that were either residential or farmland, which had an average of 9.0 species per square. This is what one would expect, but it was a surprise that residential areas were scarcely different from farmland. Only 20 species were present in more than 25% of squares, 15 native (12 tree and 3 shrub) and five alien.

Two species only were almost universal, **Elder,** *Sambucus nigra*, and **Ash**, *Fraxinus excelsior*, present in 93% and 90% of squares respectively. Both regularly produce vast amounts of seed, and were almost equally abundant in urban and rural areas. Elder is spread by birds, Ash on the wind. No attempt was made to quantify the number of seedlings observed, but Ash was present in far greater numbers than any other species in almost all areas.

Sycamore, *Acer pseudoplatanus*, was the next most frequent, present in 76% of squares, and also evenly spread between town and country. It is probably less frequent than Ash only because seeding trees are less frequent, and it is only spread by the wind. Its seedlings germinate abundantly, but are relatively slow growing, don't flourish in shade, and often fail in their first year. **Buddleia**, *Buddleia davidii*, was present in 80% of urban squares but only 46% of rural ones. It was included because its light seeds can get blown anywhere, and in time it forms a tough tall, almost evergreen shrub which is increasing whose role in the structure of plant cover is changing rapidly. It also tends to be ignored by botanists.

English Elm *Ulmus procera*, was present in 68% of all squares. It regenerates by suckering, and successive waves of Dutch Elm Disease in the past thirty years have had the effect of a massive number of very small trees, a number vastly greater than the original mature trees that were killed, all waiting their chance to dominate. If and when the numbers of the beetles, or the virulence of the fungus, alter, Elms will once again come to dominate much of the landscape as they did before 1975. It was only marginally more widely distributed in Somerset than in Bristol.

Hawthorn, *Crategus oxyacantha* and **Holly,** *Ilex aquifolium,* were present in 64% and 63% of squares, but whereas Hawthorn was as common in urban areas as in rural, Holly was much more widespread in N Somerset (86%) than Bristol (48%). As both species are primarily spread by birds, and both take 18 months to germinate, the causes of this difference are not clear. Holly rarely comes to dominate woodland, normally existing for many years as a slow growing sub-shrub. **Hazel**, *Corylanus avellana* present in 57% of square was the only other species found in more than half the squares, and, like Holly, it was much more abundant in N Somerset (89%) than Bristol (38%). It is possible that the density of Grey Squirrels is lower, and of Hazel bushes higher, in rural areas than in urban ones.

The next eleven species were present in around a third of squares (26% to 42%). They include seven native species and four aliens. **Laurel** *Prunus laurocerus* was regenerating in 42% of squares. Its heavy black berries are a favourite of Blackbirds, and being evergreen it grows fast early in the year, and can rapidly shade out all other vegetation. **Yew**, *Taxus baccata* at 40%, is a limestone specialist, widely spread by birds, and an evergreen. Its dense shade precludes other plant species, including its own seedlings, but nowhere locally has it yet become the dominant species in a woodland, partly because it rarely grows tall. **Beech** *Fagus sylvatica* is present in 38% of squares, but 63% in N Somerset where it is widespread in woodland and

only 23% in urban areas, where it is largely restricted to squares with woods. Seedlings grow slowly in shade, and have to wait for a gap in the canopy if they are to mature. **Wild Cherry**, *Prunus avium* present in 35% of squares, often regenerates by suckers, but is also spread by birds. As a woodland tree it is quite scarce, and presumably not favoured by foresters, but it may be becoming commoner. **Field Maple**, *Acer campestre* present in 34% of all squares, but 51% in rural areas, is a common hedge plant, which rather rarely gets the chance to mature and seed.

The **Common Oak**, *Quercus robur*, is present overall in only 31% of squares, though 46% in N Somerset, and it is now rare in woodland because of Oak Wilt. However it clearly can succeed in more open conditions, and can be found along with hawthorn in many abandoned fields. It is being challenged by **Holm Oak**, *Quercus ilex*, present in 33% of squares, and equally widespread in both rural and urban area. Because it is evergreen this species is becoming dominant on some bare ground and cliff faces. It grows slowly, but refuses to die. The other challenge to Common Oak is **Turkey Oak**, *Quercus serris*, which is very fast growing, has larger acorns, keeps its leaves for longer, and was present in 25% of squares. It looks as if these two species will form a much more significant part of our tree flora in future.

Two other native species, **Wych Elm** *Ulmus glabra* and **Sallow** *Salix caprea* were present in 31% and 30% of squares. Both produce ripe seeds by the end of May, and the resulting seedlings can be a metre high by October, though only if they find appropriate damp conditions free from competition. That is why both, though successful adult species, produce few seedlings.
Finally in this group **Norway Maple**, *Acer platanoides* present in 30% of urban square but 49% of rural ones. As a woodland tree it is rare, but once a seed producing tree appears the seedlings can readily dominate their surroundings by outgrowing, and out-shading everything else, except Laurel. It is a very vigorous species, common in Europe, that has essentially spread from gardens and street plantings.

Eight more species were recorded in more than 10% of squares. The aliens, **Horse Chestnut,** *Aesculus hippocastanum*, in 23%, and **Bay** *Laurus nobilis* in 16%, were more frequent than might be expected and **Lawson's Cypress** *Chamaecyparis lawsonii*, was present in 20% of Somerset squares, mostly in woodlands where adult trees had been planted. **Spindle** *Euonymus europaeus* was recorded in 25% of squares, **Apple**, *Malus domestica*, mostly from apple cores, was found in 29% of Bristol squares, and **Alder**,

Alnus glutinosa, a riverside specialist, in 13% of all squares. **Silver Birch** *Betula pendula* was only present in 11%, because, though millions of seeds are produced annually, it only survives on open sites where there is no competition. **Large-leaved Lime** *Tilia platyphyllos* was found in 11% of squares, which was a surprise, as it is a very rare tree in the wild. It is however now a commonly planted street tree, which may be the origin of the seedlings. **Small-leafed Lime** only produces viable seeds in the hottest summers.

The remaining 33 species comprise 11 native and 22 alien species, and of the latter 13 were only found once. The native species are for the most part fairly uncommon, which suggests that they are ill-adapted to the conditions here, but with one very obvious exception. **Whitebeam** *Sorbus aria* is a native limestone specialist, whose seeds are spread by birds, but only one seedling was found. Seedlings may have been overlooked, but the species is most often found in conditions where there is little competition, such as on cliff faces. The same is true of **Rowan**, *Sorbus aucuparia*, various species of which are very widely planted in streets and gardens, but which is very scarce as a native.

Comment

Clearly the existing structure of our woods, mainly Ash and Hazel, with Oak and Yews, and plantations of Beech, various forestry conifers, with Cherry and Small-leaved Lime in ancient woodland remnants, is altering under our eyes. Laurel, Holm Oak, Turkey Oak, Norway Maple and Sycamore are likely to increase, Elm may come back, Common Oak and Hazel, and all plantation conifers, may decrease.

Oliver Rackham suggests, in British Woodland, New Naturalist 100, that any simple repeatable detailed study of woodland plants will be of huge value for the future. This one can be repeated in any area, and at any time, and any season. It is not complex, demands only basic knowledge, and takes little time. It provides crude statistics over a wide area which nevertheless reveal a significant truth.

			Dist.				Dist.
Species			%	Species			%
Ash	t	n	91	Lawson's Cypress	t	a	11
Sycamore	t	n	76	Black Pine	t	a	4
Elm, English	t	n	68	Oak Red	t	a	3
Hawthorn	t	n	64	Robinia	t	a	3
Holly	t	n	63	Laburnum	t	a	2
Yew	t	n	40	Grand Fir	t	a	1
Beech	t	n	38	Monkey Puzzle	t	a	1
Cherry	t	n	35	Tsuga	t	a	1
Maple, Field	t	n	34	Alder Italian	t	a	1
Elm, Wych	t	n	31	Almond	t	a	1
Oak, Common	t	n	31	American Thorn	t	a	1
Sallow	t	n	30	Fig	t	a	1
Apple	t	n	20	Lombardy Poplar	t	a	1
Alder, Common	t	n	13	Swedish Whitebeam	t	a	1
Silver Birch	t	n	11	Western Red Cedar	t	a	1
Lime, Large- leaved	t	n	11	Elder	s	n	95
Sweet Chestnut	t	n	10	Hazel	s	n	57
Rowan	t	n	10	Spindle	s	n	25
Poplar, White	t	n	8	Box	s	n	7
Hornbeam	t	n	7	Buckthorn	s	n	3
Willow, Crack	t	n	4	Buddleia	s	a	67
Willow, Grey	t	n	4	Laurel	s	a	42
Poplar, Black	t	n	3	Rhododendron	s	a	7
Larch	t	n	2	*Viburnum tinus*	s	a	7
Whitebeam	t	n	2	Portuguese Laurel	s	a	4
Maple, Norway	t	a	37	Plum	s	a	4
Oak, Holm	t	a	33	Sumach	s	a	2
Oak, Turkey	t	a	25	Medlar	s	a	1
Horse Chestnut	t	a	23	Lilac	s	a	1
Bay	t	a	16	Pyracantha	s	a	1

Table. Lists the species, showing those defined as trees (t) and shrubs (s), native (n) and alien (a) and the overall percentage of the 91 squares in which they were found.

Yew: A History by F Hageneder

A review by M Williams

As its name suggests, this book is dedicated purely to one tree and it tackles the subject admirably. It is written by a founder member and current chairman of Friends of the Trees, but by profession Hageneder is an ethnobotanist. As a result he goes much further into the more obscure aspects of his subject than one might expect, probing into every aspect of their range, structure, reproduction, and longevity. He dwells lovingly on the tree's toxicity, for example, explaining that apart from the bright red aril – flesh – of the berries, every part is poisonous to man and most animals. Then there are detailed drawings and macro photographs of the leaf structure and an examination of the puzzling phenomenon of 'bleeding' Yews.

This level of detail should not put off amateurs, however, for his love of the subject matter shines out of every page. The photographs are wonderful and endlessly fascinating, while the text bubbles along effortlessly. As a result, while it makes a wonderful 'dipping' book, many people will devour it from cover-to-cover.

After the technical chapters, Hageneder explores the Yew's cultural and historical roles. The Tree of Life was, apparently, a Yew – and as one of Britain's three native conifers, it was the original Christmas tree until Prince Albert substituted the Spruce.

Unfortunately this supremely long-lived tree has suffered badly at the hands of man. In 1966 its bark was discovered to contain powerful cancer-killing toxins and huge numbers were harvested, particularly in North America and India (the latter has lost 90% of its Yews in little more than a generation). Before that, however, it was Britain's medieval rulers' insatiable desire for long bows that led to vast numbers being felled across Europe (Continental wood was regarded as superior to British). It is thus ironic that today, while responsible for the absence of veteran Yew trees across Europe, Britain has most of the world's ancient Yews, most of which (80 – 85%) are found in churchyards. And if one needed a final reason to buy this wonderful tome, Hageneder is donating 50% of the royalties to the Ancient Yew Group.

The Yew: A History is published by Sutton Publishing at a price of £25

Bees, Bats, and Bed-bugs

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Hunt through the key word section of the new BNS Library index and you enter a weird world that starts with Algae and ends with Worms, and encompasses the whole vast diversity of wildlife in between. There are 1731, and counting, individual books in the BNS library, not to mention the long runs of volumes of journals (every number of British Birds, for instance, and a long run of the 19C journal, the Zoologist), and an extremely generous lending policy.

There are a hundred books written in the twenty first century, and another 900 written since 1950. There are 102 books in the remarkable New Naturalist series, which might surprise you as they have only just issued number 100, but they did a number of NN monographs as well.

570 books have been donated by members, the largest number from the estate of AP Richards, closely followed by donations from RG Symes, SM Taylor and D Wilson. Many books belonged to famous past members of the society including HC Charbonnier, I Roper, HH Davis, AE Hudd, and some contain comments, cuttings and letters.

The whole history of book illustration can be followed over 150 years, as successive generations struggled with the changing technology, from engraving on wood to engraving on steel, from black and white to hand-coloured, from fuzzy photographs in sepia to the startling colour detail of digital images today.

The sections are pretty well balanced. Botany wins with 480 books, and the Invertebrates have 300, Geology has 280, and the General section, a catch-all full of wonders, has 270. Birds have 250, and the Mammals just 70. One of the reasons for the large size of the Botany section is that there are 130 county Floras. The oldest is the "Flora of Shropshire", 1841, and of course EH Swete's "Flora Bristoliensis" of 1854. There are Floras for 51 counties or regions of the UK, and many have three successive Floras through which one can trace the local changes in plant life down the years. There is the first great UK Atlas by FH Perring in 1962, which led the way to so many other Atlases down the years, and the New Atlas of 2002.

There are 50 books on trees, including Oliver Rackham's revolutionary 1976 "Trees and Woods in the English Landscape" which totally

transformed our understanding of how to look at woods, and H Wilkinson's beautiful "Epitaph for the Elm" 1978. There are lovely books on Mosses and Lichens, and thirty on Fungi, including "Rust Smut Mildew and Mould" by MC Cooke. There is "The Shakespeare Flora", 315 pages exploring every plant mentioned by Shakespeare in his plays, and the "Handbook of Rubi", 275 pages packed with every different sort of Bramble there is, or was in 1958.

The Geology section has fifty books on fossils, often with complex and detailed illustrations. There are detailed geologies of every region of Britain, and standard textbooks illustrating how understanding grew through the nineteenth century, and wonderful general accounts such as Nigel Calders "The Violent Universe" 1969, or "The Rockhounds Handbook" 1975, LD Stamp's classic "The Earth's Crust" 1951, and Jaquetta Hawkes extraordinary "A Land" of the same year.

The Invertebrate books are as complex as the group. There are books on Ants and Stoneflies, Blowflies and Butterflies, Dragonflies and House flies, Grasshoppers, Crickets, Cockroaches and Harvestmen, Shieldbugs and Squashbugs. There are books on the insects of Nettles, and the insects of Docks, books on Lice and Mites and Leaches, on Snails and Slugs and Starfish, on Micro-moths and Macro-moths, on Spiders and Thrips and Wasps and Weevils. There is the first New Naturalist on "Butterflies" by EB Ford, published as an extraordinary act of faith in war torn Britain in 1945.

The Ornithology section has many of the classics- Lord Grey of Falloden's "The Charm of Birds"1927. David Lacks' "The Life of the Robin" the first monograph published in 1943, which transformed the way we understand species. Two of James Fisher's three volumes of "Bird Recognition" published in 1954, WB Alexander's "Birds of the Ocean" 1927 and Tony Prater's "Estuary birds of Britain and Ireland" 1981. There are avifauna of 15 counties, and monographs of 30 species. There are extraordinary books such as Eastwoods "Radar Ornithology" 1967, WB Baras "The English Sparrow in North America" c1890, JTR Sharrock's "Frontiers of Bird Identification", 1980, and M Shrub's "Birds Scythes and Combines", 2003.

There are also the big works, Witherby's five volume "Handbook" of 1931, and its replacement, the nine volume "Birds of the Western Palearctic" published between 1977 and 1994. There is JTR Sharrocks "Breeding Atlas" of 1976 and DW Gibbons "The new Atlas" of 1993, and the "European Atlas" of 1997.

The Mammal books cover all British mammals, both in general terms such as "The Atlas of Mammals in Britain" by HR Arnold, 1993, GC Corbets very through "Handbook of British Mammals", 1991, or "State of British Mammals 2003" by D MacDonald, and in specific monographs. These include RM Lockleys' amazing "Private life of the Rabbit", 1964, which inspired Watership Down, and Ernest Neal's "The Badger" of 1948 , one of the very early New Naturalist monograph series.

The general section has perhaps the most eclectic collection. There is N Tinbergen's "Social Behaviour in Animals" 1953, and M Rothschild's famous 1952 "Fleas, Flukes and Cuckoos", a study of parasites. There are studies of ecology and conservation and the fascinating "Bristol and Adjoining Counties", 1955 by CA MacInnes, a 355 page book on the natural history of the region prepared for the British Association meeting of that year in Bristol, giving a detailed history of a world that has vanished. Kenneth Mellanby "Pesticides and Pollution", 1967 and "Farming and Wildlife", 1987, Britain's version of "Silent Spring". S Winchester, 2001, "The map that changed the World" describes how William Smith's manual work cutting the Somerset Coal Canal created the modern understanding of geology. Other gems include WG Hoskins "The Making of the English Landscape", 1955, P Marren's loving "The New Naturalists", 2005, C Darwin "The Descent of Man", a 1930 reprint, and J Bronowski's "The Ascent of Man" 1976, a now forgotten TV series. Also worth mentioning E Pollard "Hedges", 1974, which explained how hedges could be dated and Colin Tubbs famous account, "The New Forest" 1986.

There are Natural Histories of Steep Holm and the Lakes, Dartmoor, the Forest of Dean, Hitchen, and another eighty places around Britain and the world. There are 25 books about naturalists including works on Richard Jefferies, John Ray, Gilbert White and Linnaeus.

Of local relevance there is G Hall 1971 "Man on Mendip" and R Atthill "Mendip, a new study" 1976. J Savory, "A Man deep in Mendip" 1983 is the diaries of the late Harry Savory, pioneer caver and falconer and BNS President. There are a series of studies of the Severn Estuary and tidal power associated with the plans of the late 1970s for a barrage.

There are books on weather. B Horton "The West Country Weather Book"1995, which has trawled through the newspaper of the past two centuries to bring news of every disaster; JD Hanwell 1968 "Storm on Mendip" recounts the events of the day when bridges were swept away throughout north Somerset; G Manley "Climate and the British Scene",

written in 1952 is an interesting comment written at the peak of the 20th century warming episode.

And there are books on Phenology, starting with Gilbert White's "Natural history of Selborne". The Bath naturalist, L Jenyns, who published White's book, has his own account of phenology in "Observations on Natural History", and there is the Met. Office Phenological report for 1930.

Perhaps the last word should go to D Attenborough's "Life on Earth" 1980, the book of the acclaimed TV series, and, because of its relevance to all the rest of creation, William Stanton's disturbing "Rapid growth of Human Population 1750-2000", 2003.

I have mentioned a mere 58 books that caught my eye as I catalogued the wonderful collection that the BNS possesses. They are just a tiny sample of the treasures that exist for you.

An Appreciation of a Constant Librarian.

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The success of the Library of the Bristol Naturalists' Society is due particularly to the voluntary efforts of a range of members who form the Library Committee. That Committee is guided in its activities by an Honorary Librarian, who is elected by members. At the last Annual General Meeting in January 2007, Mrs Anne Hollowell stood down after some 10 years as the Society's Honorary Librarian.

The members of Council, the Library Committee, and of the Society, wish to acclaim the contribution made by Mrs Hollowell as Librarian. Amongst Anne's other notable Society offices have been as President for 1972 and for 1973, and as Hon. Editor of the Proceedings for the issues for 1995 to 1997. Anne was elected as an Honorary Member of the Society in 1991.

In 1967 the Chairman of the Library Committee invited Anne, as a member of the Bristol City Museum staff (later Curator of Natural History), to sit on Library Committee as the representative of the Museum. Mrs Hollowell has remained as a member of the Committee since that date, this year completing 40 years Library Committee service.

From 1986 the Library Committee unfortunately had to function without the benefit of an Hon. Librarian's advice. Following yet another AGM with no appointment Anne agreed during 1996 to be co-opted by Council as Hon Librarian. She served during that year and was formally elected at the next AGM, and then remained as the Society's Hon. Librarian until January 2007.

Mrs. Hollowell, whilst having much involvement and experience with the running of the Society's Library, had no formal library-related qualifications. Such was Anne's interest and enthusiasm for the Library all that was to change when she signed up for formal training.

Anne completed in 1998 a distance learning course of 2 years of study with Soundwell College, West Bromwich, gaining a City and Guilds 7370 Library and Information Assistants Certificate. Simultaneously she undertook a part-time (two days a week) course with the University of North London, being awarded an MA degree in Information Services Management in 1998. As if those challenges were not sufficient Mrs

Hollowell also attended practical classes at the City of Bristol College for 4 years (a non-examination course, one day a week) in practical Craft Skills Level 2 "Book Binding, Restoration and Preservation".

The formal qualifications and training Anne Hollowell gained during her time as the Society's Hon. Librarian clearly benefited the Society immensely. They were however, "the icing on the cake" since so much of Anne's time and energy were devoted to physical effort in maintaining the Library (even sliding book cases around on reversed carpet tiles!), in establishing workable library systems, compiling Library statistics, and readily advising the Committee and Council.

Fortunately Anne has agreed to remain on the Library Committee, and to maintain a watching brief over Library matters in the absence of an elected Librarian. The Society owes Anne Hollowell a considerable debt of gratitude.

Bristol Naturalists' Society
Annual Report of Council for 2006

The aims of the Bristol Naturalists' Society for 2006 continued to be "*the promotion of education and research into natural history, including geology, with special reference to the Bristol District; and the promotion and conservation of the British fauna and flora, and protection of geological and geomorphological sites*".

The Society's activities consisted of general and specialist sectional indoor and field meetings. The Society's Sections covered Botany, Geology, Invertebrates and Ornithology, and there was an informal Mammal group. The preparation and distribution of the Society's publications and the maintenance and development of its Library consumed the greater part of its income, and those activities were managed by committees that worked to plans and budgets agreed by Council (the Trustees).

At the suggestion of members, a Portable Loop System was purchased for use at indoor meetings, for the benefit of those hard of hearing.

In a further innovation towards the end of the year, members were invited to observe Council at work by attending Council meetings as observers. It is hoped that this will be of benefit to the Society.

Education
29 talks and 45 field meetings were organised by the Society during 2006. These offered an interesting and informative programme of activities concentrating particularly, but not exclusively, on the Bristol District. There were:-

- 6 General talks and 1 General field meetings
- 6 Geology talks and 2 Geology field meetings
- 6 Ornithology talks, 1 fieldwork meeting, and 13 Ornithology field meetings
- 4 Invertebrate talks and 5 Invertebrate field meetings
- 6 Botany talks and 17 Botany field meetings
- 3 Mammal field meetings

Library

Members responded appreciatively to the reports of new accessions which featured regularly in the Bulletin. Persistent efforts over several years by our Hon. Librarian at last led to a copy of a University of Bristol special report being supplied to replace one which went missing. The Committee noted with pleasure the Ancient Yew Group web pages on the Tree Register. Member Tim Hills had made considerable use of the Society's Library in researching the ancient yews of the country.

The Library Committee completed the year's work within the budget agreed by Council. Details of all journals held, and of about 1750 books, were entered onto the computer database, accession labels being added to books as they were catalogued. The database was used to produce a range of reports. A new flat screen computer monitor improved clarity and freed table space. During the year 38 members (33 in 2005) made 269 (253) visits to the Library and borrowed 239 (253) items. 4 (1) of these visits were made by new members and 5 (7) visits were by members of the Museum staff. 20 journal runs were received by subscription, 32 by exchange, and 16 by donation. 17 (10) books were purchased. 23 books, circa 50 issues of journals, and 21 reports were accepted into the library stock. The Committee was pleased to receive more issues of relevant official reports. Special name plates were added to items donated, and we were indebted to the following for these donations:- Mrs. R. Atkins, Dr. R. Bradshaw, Bath Geological Society, Bath Natural History Society, Bristol Environmental Record Centre, the Estate of the late Mr. D. Cope, the Estate of the late Mr. A Fear, Mr. B. Frost, Mrs. M. Helier, Mrs. A. Hollowell, Mr. S. Howe, Mr. P.J.M. Nethercott, Mr. R.G. Symes, Mr. D. Wilson, and the Regional Director of London Camera Exchange.

In accordance with the charitable status of the Society, but subject to appropriate security considerations, access to the Library was made available to others, particularly to the University of Bristol, as well as members on the curatorial staff of the City Museum. The Society thanks Kate Brindley, Director of Bristol's Museums, Galleries and Archives, for continued use of the Library room, for the assistance given to members during the year by Museum staff, for resolving heating problems by provision of a new electric radiator, and for arranging for repair of chairs which dated back to the days of the Bristol Institution.

Mrs A.F. Hollowell was re-elected as Honorary Librarian. Members elected at the start of the year were Mrs A.M. Wookey (Chair) and Messrs R.L. Bland, R.G. Symes, B. Tizard, D.P.C. Trump, J. Webster, and D.A. Wilson. The Committee welcomed Mrs. P. Gooding and Mrs. R. Atkins, both co-opted by Council during the year. The Committee met on four occasions. The Society's Archivist was invited to attend meetings. Members continued to staff the Library from 12.30 p.m. to 1.30 p.m. on Wednesdays, and from 10.15 a.m. to noon on Saturdays. All members of the Committee are thanked for their assistance during 2006. Mrs Hollowell announced that she intended to retire as Librarian at the end of 2006, but would like to continue on the Library Committee. She was thanked for her considerable expertise and enormous time contribution as Hon. Librarian from 1995 to 2006.

Publications

The Committee was: Chair – President; Messrs R.L. Bland (editor); D. Davies (Bulletin); D. Strawford (website); D.W.B. Frost (circulation); S. Fay (treasurer); P. Belcher; R. Muston; A.G. Smith; T. Smith; D. Trump.

Volume 65 of *Nature in Avon* was issued to members in November. The Publications Committee is grateful to Richard Bland (Editor) for producing the volume alongside his many other contributions to the running of the Society. The latest volume includes innovations to appeal to a greater readership, interspersing the formal papers with articles on local wildlife sites and naturalists.

The *Avon Bird Report* for 2004 was joint first in the annual competition for the best bird reports in the country, and its editor Dr Harvey Rose is congratulated on this achievement. The 2005 report was issued to members in November.

The Society's monthly bulletin continued to provide information on the Society's events, also items on local wildlife and on local naturalists. Recent contributions from Dr Clive Lovatt have increased the botanical content. The Committee is appreciative of the work of David Davies in producing each issue. They also pay tribute to the coordination of the distribution network by Brian Frost, whose team of postmen and women saves the Society much in postage.

The website's visual impact has been improved by some colour photographs, thanks to Webmaster Dave Strawford. Comments and feedback on any of the Society's publications are welcomed.

Archivist
Research into the Society's history and into local personalities has continued. Plans to transfer some material to electronic media, with proper regard to permanence, continue. Obituary material and answers to enquiries have been supplied.

Research and Conservation
Records of observations made by members as part of both local and national recording schemes formed the basis of the biota sections of *Nature in Avon* and were passed to Bristol Regional Environmental Records Centre (BRERC). Surveys included botanical, mammal, invertebrate and ornithological recording schemes. Members of the Society assisted with data entry at BRERC.

The Society maintained close local links with the City Museum & Art Gallery, with Bristol University (especially the Earth Sciences Dept.), with the Avon, Gloucestershire and Somerset Wildlife Trusts, VOSCUR (The Voice of Bristol's Community and Voluntary Sector), Avon Gorge & Downs Wildlife Project and with Bristol City Council. The Society was represented on the Durdham Downs Management Plan, and continued to be represented at meetings of the Leigh Woods Advisory Committee. The Society is a partner in the Avon Biodiversity Action Plan, and both the North Somerset and South Gloucestershire BAPs. Here the Society's main role is assisting in the monitoring process and acting as adviser at meetings. Nationally it has been involved with the British Trust for Ornithology, Botanical Society of the British Isles, the Woodland Trust, and Royal Entomological Society. One member (Dr M. H. Martin) chairs the Management Committee of the Lower Woods Nature Reserve, and several others serve on it.

Promotion and Publicity
As always, particular emphasis was placed on the encouragement of new members. The Society publicised its meetings with its monthly bulletin. Posters announcing forthcoming meetings were produced regularly and displayed with membership leaflets, particularly in libraries. Press releases were also issued to promote the events run by the Society. To promote the Society's activities and to attract new members, stands were taken at the following events: the North Somerset Show, the Bristol Festival of Nature, Bristol Harbour Festival, and the University of Bristol Alternative Careers Fair. The Society's publications were offered for sale, and although the revenue from these was small, the main benefit of attending was to promote the aims of the Society, as was the giving out of Membership Leaflets.

Welcome publicity also came from a feature in the *Bristol Evening Post* on the 15th. August regarding the grant given by the Society to the Arno's Vale Cemetery Restoration Appeal. The Society's website, which was appreciated by members and non-members, was also instrumental in publicising the Society, and obtaining new members. Particular mention must be made of Richard Bland's popular 'Weekly News' feature.

Grants

Three grants were made during 2006 totalling £850. A grant of £500 was made to The Arnos Vale Appeal. This will help ensure that the renovation of the cemetery will assist and encourage the wildlife for which it has become well known.A grant of £250 was made to A Morss for a Pied Flycatcher study. A grant of £100 was made to S Carpenter for help in the production of a RIGS leaflet

Membership At the end of 2006 Society membership was 544, compared to 551 the previous year In the course of the year the deaths were reported of Mr. G. Redfern, Mr. M. Trotman, Prof. A. Willis, and Mr. R. Howard.

Thanks

The Society is indebted to the many members who gave their time freely to support its activities and in some cases generously donated funds. This help was much appreciated and was vital in helping it meet its objectives. Special mention must be made of members who save the Society substantial postal charges by hand delivery of its publications. The Society acknowledges with gratitude the facilities and support given by the Earth Sciences Department, University of Bristol, and Mr Mark Moore, Headmaster of Clifton College by providing premises for meetings, and Ms Kate Brindley, Director of Museums, Galleries and Archives, Bristol City Council for continued support of the Society Library located within the City Museum & Art Gallery.

The Future

It is hoped that the invitation for members to observe Council at work, by attending Council meetings as observers, will be of benefit to the Society in the future. Council will also be planning the Society's 150th. anniversary in 2012.

Botany Section Report, 2006

Pam Millman

At the AGM on 24 Jan the Officers and Committee were re-elected: President: Mr A.G.Smith, Hon.Secretary/Treasurer: Mrs P. Millman. Committee Members: Ms L. Houston, Mrs C.Kitchen, Mr M.Kitchen, Mr C.Hurfurt, Mrs M.Webster., Ms M.Wood, Mr T.Titchen.

23 Jan	T		AGM, members evening
27 Feb	T	A Robertson	*Sorbus* Evolution in the Avon gorge
4 Mar	T	P Millman	Mosses for beginners
12 Mar	F	P Martin	Bryophytes at Goblin Combe
2 Apr	F	L Houston	Early flowers in Avon Gorge
22 Apr	F	T Smith	Monks Wood reserve
25 Apr	F	N Hudson	Hencliff Wood
7 May	F	M Webster	Felton Common
19 May	F	P Millman	Tyntesfield
11 June	F	M Webster	Redding Pits
21 Jun	F	M Wood	Arno's Vale
27 Jun	F	N Wray	Botanic garden
15 Jul	F	C Hurfurt	Lansdown
28 Jul	F	A Morss	Troopers Hill
1 Aug	F	T Titchen	Oaklands
13 Aug	F	M & C Kitchen	Severnside
23 Sep	F	T Smith	Ferns at Snuff Mills
23 Oct	T	S Ford	National Trust Nature Conservation
27 Nov	T	M Webster	Making a Flower
28 Dec	T	T Titchen	Flora of Cape Town

Following a varied program of lectures in the winter we have had a full program of Field Botany meetings. We clambered over steep paths seeking early flowers in the Avon Gorge with Libby Houston and have visited sites with an unusual flora at Hencliff Wood, Arno's Vale and Troopers Hill. We are pleased to have members other than the committee leading two very successful meetings. The Felton Common meeting led by Margaret Webster was in response to a request following our recording meeting last year to visit the site for spring flowers. Clive Lovatt led two excellent impromptu meetings at the Avon Gorge on a brief visit to Bristol from Malawi. Nick Wray led us round the new Botanic Gardens in Stoke Park Road amazing us both by the scale of the project and the work already

achieved. This garden is a 'first' for the UK in following the new arrangement of plants in the Phylogeny section, this area of botany having changed so much following progress in molecular genetics. Pam Millman led a further meeting to the National Trust site at Tyntesfield where we are recording plants in the estate for the first time since access was not possible for the Flora of Bristol.

We continue to send records to BRERC. Members are involved with both the Somerset and Gloucestershire Rare Plants groups.

We should like to acknowledge the work of Dr Clive Lovatt both in editing Bristol Botany and contributing articles to the Bulletin. Members will find his section in Nature in Avon well worth reading.

Invertebrate Section Report , 2006

R Barnett

Ray Barnett and Tony Smith were re-elected Honorary President and Honorary Secretary, respectively at the AGM held at the City Museum & Art Gallery, Bristol. The President handed out a field identification key to scorpion flies (Mecoptera) based on that in the Aidgap Key to Lacewings, Scorpion Flies etc by Colin Plant reflecting the species which occur in the region. Specimens of these insects from the Museum collections were shown along with new entomological acquisitions. The Secretary showed new books on invertebrates that had been published during 2005.

The following meetings were held:

8 Jan	T		AGM
19 Feb	T	D Watts	Newton Park landscape restoration
14 Mar	T	N Milbourne	Ubley Warren reserve
14 May	F	R Barnett	Wick Golden Valley reserve
16 Jul	F	N Milbourne	Ubley Warren reserve
22 Jul	F	T Smith	Clapton Moor reserve
12 Aug	F	J Boyd	Dolebury Warren reserve
10 Sep	F	T McGrath	Weston Moor reserve
21 Nov	T	T Smith	How to love Snails

Ornithology Section Report, 2006

Dr. M Hill

At the 2006 AGM (the section's 82nd), held on January 20th 2006, Richard Bland was re-elected as President for his final year in the post; Mary Hill was re-elected as Secretary and Treasurer.

Joyce Callard and Alison Levinson retired from the committee and were thanked for their contributions. Present committee members happy to stand for re-election or election were - Ann and Richard Crawford, Ed Drewitt, Paul Farmer and Mike Johnson (the latter had been co-opted during the year). Sue Heap and Sheila McCarthy were proposed as new members; both had agreed to serve. All these 7 people were elected to the committee.

A feed-back sheet, circulated at the AGM, proved very helpful in indicating the types of meetings that people preferred and giving suggestions for future lectures.

20 Jan	T	R Bland	Bird population change in Bristol. AGM
25 Jan	F		Slimbridge
15 Feb	T	M Johnson	RSPB on Somerset levels
18 Feb	F		Severnside
15 Mar	T	A Swash	Quest for the Quetzal
25 Mar	F		Brean
12 Apr	F		Leigh Woods
22 Apr	F		Uphill
5 may	F		Frome Valley
16 May	F		Weston Moor
16 June	F		Stock Hill
18 June	F		Oporton Down
26 Aug	F		Ringing demo
15 Sep	T	R Bland	Fieldwork
11 Oct	T	C Martin	Farne Islands
15 Oct	F		Migration watch
8 Nov	T	P Mugridge	Wildlife on my doorstep
18 Nov	F		Uphill
8 Dec	T	J Garner	Focus on the Falklands
28 Dec	F		Chew lake

Members continue to be active in field work including the national Breeding Bird Survey, which covered 216 local squares this year, the Waterways Survey, the Heronry Survey, WeBS counts of Waterfowl and Waders, BTO Woodland Breeding Bird Survey, the Nest Record Card Scheme, BTO over-wintering warbler survey, The BTO Dartford Warbler Survey, The Atlas Trial Winter Fieldwork Survey, and the National Ringing Scheme. They also participated in BTO Garden Birdwatch, Bristol Birdwatch, and the society's own 30 year old Winter Garden Survey.

Involvement with Local Authority.

The results of the local Breeding bird Survey are sent to the four Unitary authorities Environmental departments, and in Bristol is used as part of the annual Quality of Life audit. Bristol Birdwatch is run by the Avon Wildlife Trust, and supported by Bristol City Council.

Mammal Group Report, 2006

Rachael Cooper

After a few quiet years the Mammal Group was re-launched with three field meetings towards the end of the year. In September, James Field of the Avon Wildlife Trust led a 'Riparian Mammal' day with an indoor session followed by a visit to the Trust's Reserve at Avonmouth to see Water Vole signs. In October a visit was arranged to Berkeley Deer Park to see the annual Red and Fallow Deer 'rut'. 29 people including five children attended. November saw a small-mammal trapping session at the Trust's Clapton Moor Nature Reserve, Despite freezing temperatures and a full moon, Woodmice, Bank Voles and a single Common Shrew were recorded. This project has now become a regular annual event with the results helping guide the Trust's management of the rough grass corridors for the benefit of breeding Barn Owls.

Regular contact was made with other organisations such as the Mammal Society, the Avon Bat Group and the Otter groups in the area. Regular contributions continue to be made to the Society's Bulletin and members' mammal records are deposited at BRERC.

Geology Section Report, 2006

S Flint

At the last AGM in Jan 2006 the following officers were proposed, seconded and elected without dissent: President: Simon Carpenter; Secretary: Sue Flint; Field Secretary: Tim Ewin; Committee: Margaret Poolman David Strawford. Elaine McLaren.

It was proposed and agreed that one lecture each season be a David Cope Memorial lecture in recognition of services to the BNS Geology section.

The Following meetings were held;-

18 Jan	T	E Stonebridge	AGM, Bristol Heritage in stone
15 Feb	T		Members evening
2 Mar	T	V Ragnarsdottir	Future use of renewable energy
20 May	F	S Carpenter	Oxford Museum
30 Jul	F		Willsbridge clearance
24 Oct	T	A Insole	Nigeria
13 Dec	T	CV Burek	Soil conservation and RIGS

Bristol Naturalists' Society
Statement of Financial Activities for the Year ended 31 December 2006

	2006	2005
INCOME (Incoming resources)		
Membership Subscriptions	7,336.50	7,682.00
Opening (Subscription) Debtors		-638.00
Gift Aid	1,092.38	1,140.28
Bequests & Donations	461.31	469.15
Trading	170.94	97.50
Library Sales	10.00	0.00
Interest Received	1,421.30	1,191.74
Total	**10,492.43**	**9,942.67**
EXPENDITURE		
(A) Direct Charitable		
Meetings	917.73	835.18
Books & Periodicals (Library)	646.11	558.44
Proceedings Production	1,907.00	1,668.96
Avon Bird Report	1,675.00	1,387.41
Bulletin Production	1,202.40	1,240.84
White Sheet Production	74.75	66.50
Distribution Costs	1,003.29	1,197.46
Subscriptions	85.00	0.00
Publicity	151.93	214.27
Grants	850.00	3,050.00
Total	**8,513.21**	**10,219.06**
(B). Administration		
Print & Stationery	117.61	172.27
Postage & telephone	149.11	100.94
Software	25.00	0.00
Hardware	139.00	0.00
Insurance	180.23	223.24
Audit	0.00	0.00
Miscellaneous	329.27	144.68
Total	**940.22**	**641.13**
Operating Surplus (Deficit)	**1,039.00**	**-917.52**

BALANCE SHEET AS AT 31 DECEMBER 2005

	Notes	2006	2005
ASSETS			
Current Assets			
Prepayments	1	510.84	322.45
Investment Accounts	2	11,382.70	11,137.56
Bank (Lloyds)		3,610.23	4,584.59
Bank (CAF)	3	24,810.84	23,834.47
Bank & Cash (Sections)	4	403.27	224.81
		40,717.88	**40,103.88**
LIABILITIES			
Creditors			
Subscriptions Received in Advance		196.50	201.50
Accrual (postage)		0.00	420.00
		196.50	**621.50**
Total Assets less Total Liabilities		**40,521.38**	**39,482.38**
CAPITAL			
General Fund	5	11,201.96	10,472.69
Designated Funds			
Milton		6,136.88	5,898.55
Memorial		13,959.99	14,060.35
Conservation		441.99	426.64
Library		2,392.83	2,299.74
Ornithological Special Fund		1,141.91	1,085.40
Restricted Funds			
Hector Hockey		5,245.82	5,239.01
		40,521.38	**39,482.38**

1 Prepayments

Meeting Rooms	250.00
Insurance	64.84
Periodicals	196.00

2 National Savings

	Hector Hockey Fund (Restricted)	Milton Fund
Opening Balance	5,239.01	5,898.55
Interest Received	204.81	238.33
T/f to Lloyds (Grants)	-198.00	0.00
Closing Balance	**5,245.82**	**6,136.88**

3 **CAF**

	A	B	C	D	E
Opening Balance	5,962.34	14,060.35	426.64	2,299.74	1,085.40
Interest Received	259.78	551.64	15.35	93.09	56.51
Transfers (Grants)	652.00	-652.00		0.00	0.00
Closing Balance	**6,874.12**	**13,959.99**	**441.99**	**2,392.83**	**1,141.91**

A General Fund B Memorial Fund C Conservation Fund D Library Fund
E Ornithology Special Fund

4 **Sections**	**Ornithology**	**Geology**	**Botany**
Opening Balance	55.03	34.55	135.23
Grant from General Fund	225.00	0.00	150.00
Interest Received	0.00	0.00	1.79
Transfer to General Fund	0.00	-34.55	0.00
Net Expenditure	-113.10	0.00	-50.68
Closing Balance	**166.93**	**0.00**	**236.34**

5 **General Fund**

Opening Balance			**Represented by:**	
Bank (Lloyds)	4,584.59		Paid from Lloyds A/c	9,880.04
Bank (CAF)	5,962.34		Adjustment from 2005	-0.50
Sections	224.81		Sections expenditure	-161.99
Prepayments	322.45		Paid into Lloyds A/c	9,281.18
Creditors	-621.50	10,472.69	Transfer from Sections	-34.55
			Interest received	259.78
Closing Balance			Funds Transfer to CAF	652.00
Bank (Lloyds)	3,610.23		Debtors movement	188.39
Bank (CAF)	6,874.12		Creditors movement	425.00
Sections	403.27			
Prepayments	510.84			
Creditors	-196.50	11,201.96		
Movement		**729.27**		**729.27**

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INSTRUCTIONS FOR AUTHORS

The editor welcomes original papers or short notes on the natural history of the greater Bristol region for consideration for publication in the Proceedings. All papers for consideration should reach the editor by the end of November for publication in the following year. All Society Reports and Biota should reach the editor by the end of February in the year of publication.

Whenever possible, text should be submitted electronically in Word. The data for graphs should be sent in Excel, and any other illustrations should be submitted electronically.

The Editor welcomes digital photos of any natural history subject taken in the region, whether relevant to an article or not. They should be of the largest pixel size possible.

References should be listed at the end of the text, in alphabetical order of the first author's name, and should take the following form. (with book and journal title in italics and first line hanging).

Book: Author (Date). *Title*. Place of publication: Publisher. - e.g.

Rackham, O. (1986). *The history of the countryside*. London: J.M. Dent.
Clapham, A.R., Tutin, T.G. and Warburg, E.F. (1952) *Flora of the British Isles*. Cambridge at the University Press.

Paper: Author (Date). Title. *Journal Name*, volume (part), page nos. - e.g.

Ross, S.M. and Heathwaite, A. L. (1986). West Sedgemoor: its peat stratigraphy and peat chemistry. *Proceedings of the Bristol Naturalists' Society*, **44**, 19-25.

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Rerum cognoscere causas - Virgil